Notebook, Volume 12

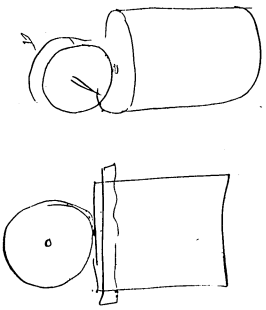
This volume covers the period July-September 1877. Most of the notes and drawings are by Edison; others are by Charles Batchelor, James Adams, and John Kruesi. The material in this volume relates primarily to acoustic and speaking telegraphy. There are also a few drawings dealing with etheric force, the electric light, the phonograph, and the horse clipper. The volume consists of 189 numbered, unbound leaves.

Missing pages, found in facsimile in the Telephone Interferences: 1-3, 6-7, 9-11, 13-15, 18, 22, 24-25, 27-28, 31-32, 34, 36-38, 44-48, 51, 53-59, 61-62, 65-70, 72-74, 76-78, 80-84, 86-88, 90-91, 93-98, 103-106, 111, 113, 115-116, 119, 121, 123-124, 127, 129, 131-133, 135-136, 138, 142-148, 151-152, 154, 159-168, 171, 173-179, 181-182, 184-186, 188-189.

Missing pges: 41, 150, 180, 187.
Page 180 was found, microfilmed in supplement, and included here.

EDISON'S EXHIBIT. 1–12.

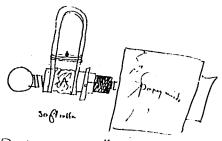
James Adams



Ans. 42 Dated July 8d 1877

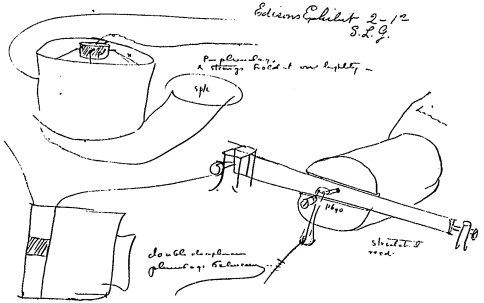
Speaking Phonograph

"July 5th 1877
Jas
Chas Batchelor
James Adams

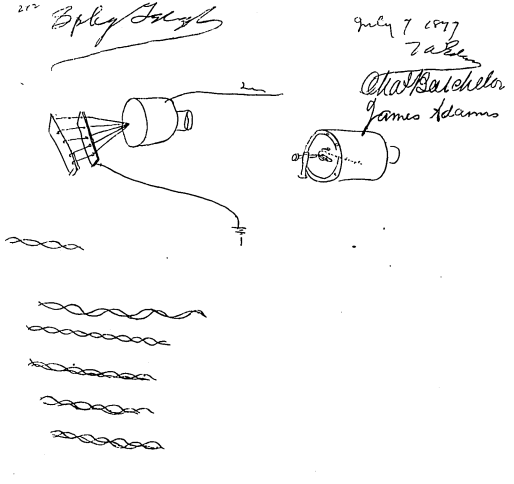


Paper cone to prevent the escape of sound, rubber cord to spring to prevent the escape of sound at the point of the diaphragm. Between a & b & a. B

Edisons Exhibit 2–12
S.L.G.



EDISON'S EXHIBIT. 3—12.



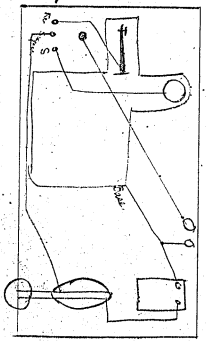
July 7th 1877

Charles Batchelor

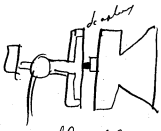
Adams

James Adams

Mica Diaphragm complete
Stuff holder
Circuit Breaker
Pivot complete pins
Mouthpiece blown



4


flexible spring
July 7 1874
in Indefon No 2.
fig 4

T. A. EDISON,

Menlo Park, N. J., 1880.

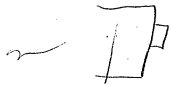
No 6. Vol 12

out for

Brunch Ink

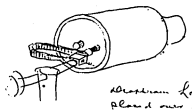
In B-130 - N.B.S.

Ink 6-12



Specification of Stereograph

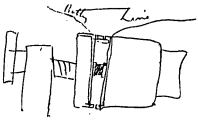
July 9 1894

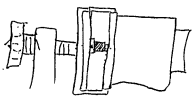


Phonogram bearing in Center a Central pivot Bearing over on side the object being taught and after recording locks phonogram when elevated. The Central pivot Bearing in Center. This is some reversed when phonogram unscrewed. Below the Weight — Cautchouc — phonogram prevents it.

Edison's Exhibit 6—12 Sheet 2.

Phonogram Cylinder to be elevated by thread





223

Speaking Telegraph

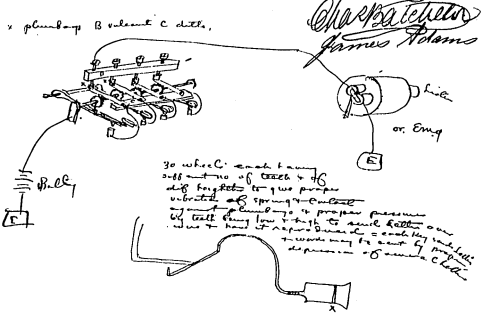
July 11 1877

J A Edison

Charles Batchelor

James Adams

X x plumbago B volcanic C disks.



To where C. each bearing
disk rests on two of screws 4 to 6
disk forgotten to give proper
vibration adj. spring 9 to screw
regulate plumbago to proper pressure
by test thru low resist. to avoid battery
use + have it respond distinct = each key
+ words may be sent by any
depression of number of disks

X diaphram

I propose to utilize the gas pipes of
a factories houses etc to convey
the human voice & allow of conversation
being carried on from any one point
of the gas system to the other system
to greater distances or different parts
of a city Experiments applicable to
gas alarm Telegraph & I accomplished

by having an extra orifice fitted to the gas pipe similar to that used by disconnecting a burner from the pipe in this I attach an extra tube of rubber or a flexible tube the other end of which is attached to the mouth piece of a tube the other end of which has a diaphragm

April 11 1677

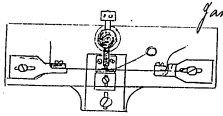
of such materiall as will prevent the gas escaping
this Speaking in one of these ends the whole of the

James Adams

gas in the tube vibrating — if another person place
one of them to his ear while another person is
talking in another part of the building
he will plainly hear what is said — Charles
is now trying the Experiment —

255.
Talking tely

July 14th 1877
Edison
Chas Batchelor
James Adams



Porcelain
Diplers

oyelem

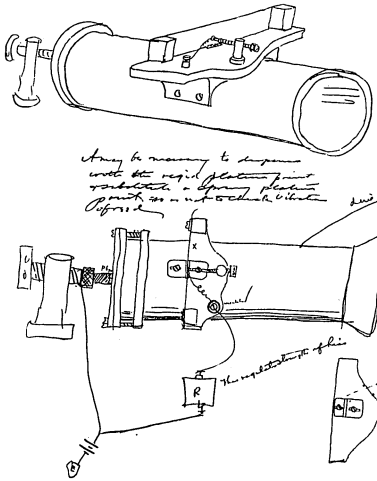
Boston

EDISON'S EXHIBIT. 10-12.

227
Sprakers Telegraph

July 16 1877
Thos Edison
Chas Batchelor
James Adams

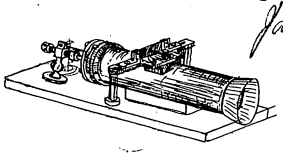
Drawing for Transmitting the Hearing Consonants (B) the hearing
[illegible] of Speech

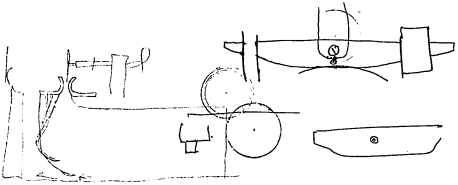

The leaf or reed
[illegible]
Arm to measure to suspension
with the rigid platinum point
[illegible]
[illegible]
The [illegible]
[illegible]
The [illegible]
[illegible]
[illegible]
[

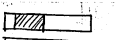
EDISON'S EXHIBIT. 11–12.

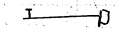
July 16 1877

Witnesses
Chas Batchelor
James Adams

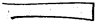




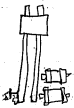


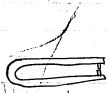


180, men
40 check out
25 Hilliland
50 For House
30 Lads clothes
175 Insurance policy
500

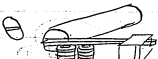


WW 200 500
HS. 75 275
275 225
A&P 225
500.



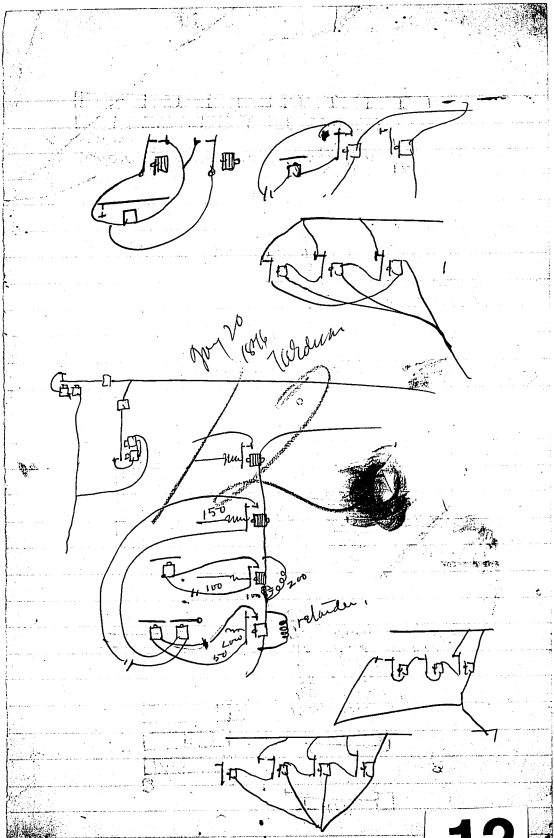


8 12
2 3
4 5
4 5

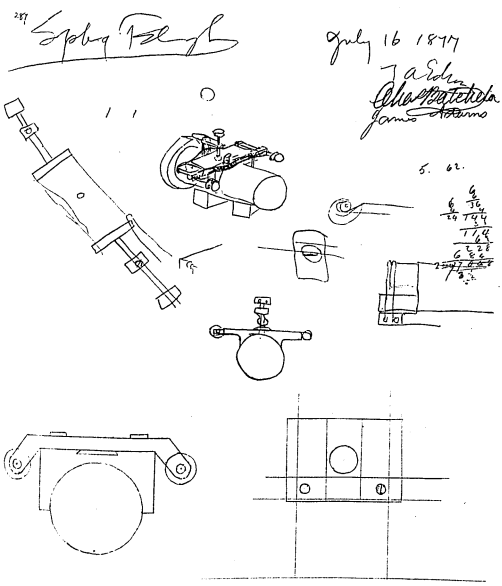


Boston
12
Boston Boston Boston Boston 12
Boston 8
10

12


150
100
200
50
relais

EDISON'S EXHIBIT 12–12.



EDISON'S EXHIBIT. 13–12.

285

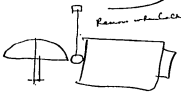
Gas Pipe Telephone —

July 16 1877

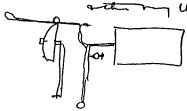
7a Edison

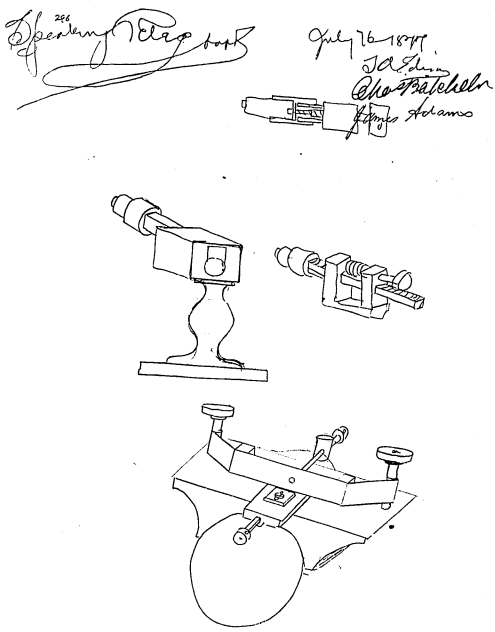
Charles Batchelor

I propose to work a small Bell by the vibration of the diaphragm setting up pendulous vibration a Watchspg + ball to actuate a Bell = or the vibration of Typpan may release a detent in a or a Gas may be taken under the vibrator of the gas or the diaphragm may (control a valve of rubber + release (in the case of vibrating) gas which acting on a sensitive Call attention



or a clock wh may be released after by the Bell.





2-71

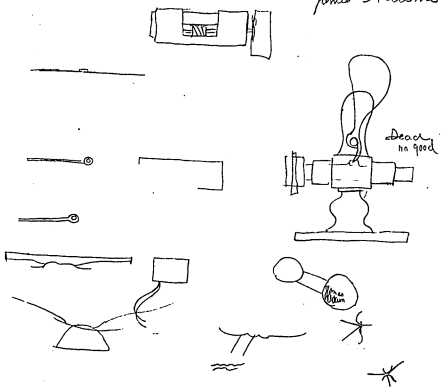
Speaking telegraph

July 17th 1877

Edison

Charles Batchelor

James Adams

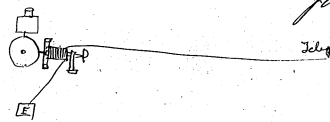


"Sydney Telephone" July 17 1877 7a Edison

Reproduced slow or fast by a Copyist + written down. Thus can be applied telegraphically

Thos A Edison

James Adams



Sheet after received is sent to Copyist who pastes it on machine similar to that I have or else Paper is stopped at rate of 25 words per minute whereas it was sent at rate of 100 per minute thus saving all Skilled labor + 5 persons doing work of 1.

Energy might be used instead of magnet to procure through be done in other ways; break indenting such a perforating with needle or by a friction wheel =

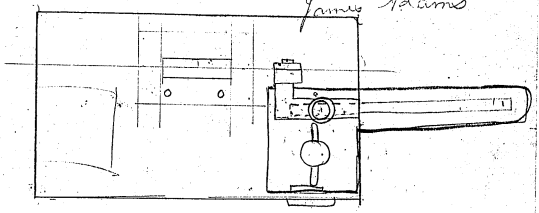
Revolving plate two Telephone tubes =

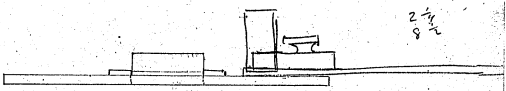
my Telegraph

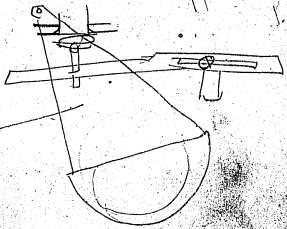
July 17 1877

Edward Shaffstall

James Adams

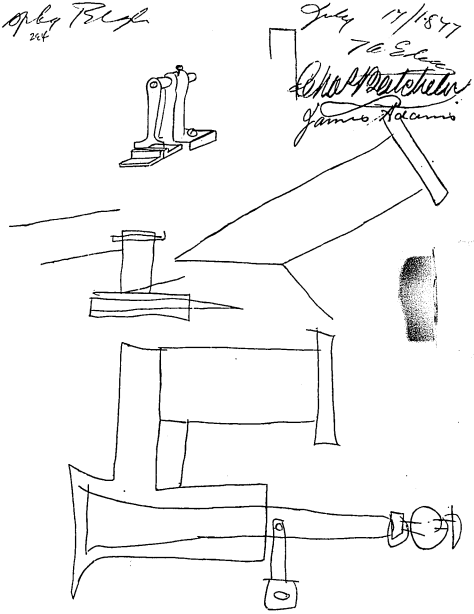


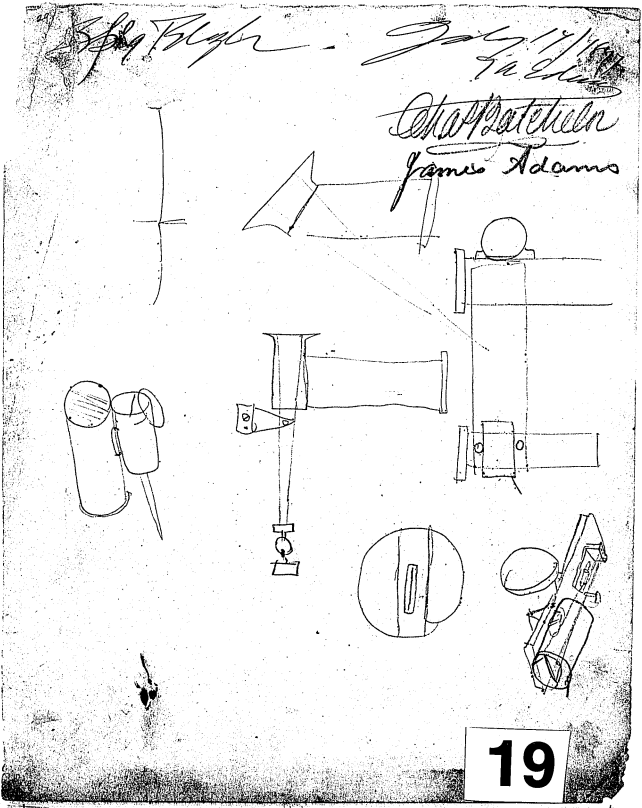




17

EDISON'S EXHIBIT. 18–12.

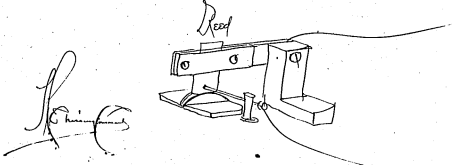



19

Speaking Telegraph

July 27. 1877

Thos Watson
James Adams



Eighth Note

Quarter

Eighth Note

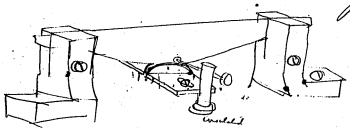
Sixteenth Note

Glorious = Telephone perfected this Morning 5 AM = articulation perfect spot 1/4 Column newspaper every word had rickety transmitter at that we are working it safely

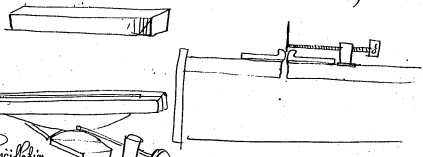
Speaking Telegraph

July 17 1877.

Alexander Graham Bell
James Adams



Missing consonants



Vocabulation of articulation

Lips

Physicals and Phrynes in majestical Mists

Tomajestical mystic cubicals Phrynicals seek

Velo Prolocharicles

Vocabulation

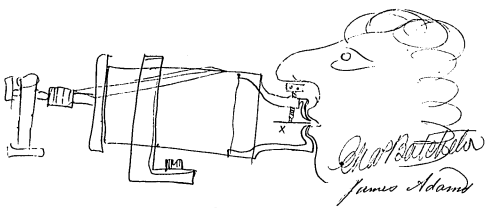
Prolocharicles of Head.

EDISON'S EXHIBIT. 22–12.

3.

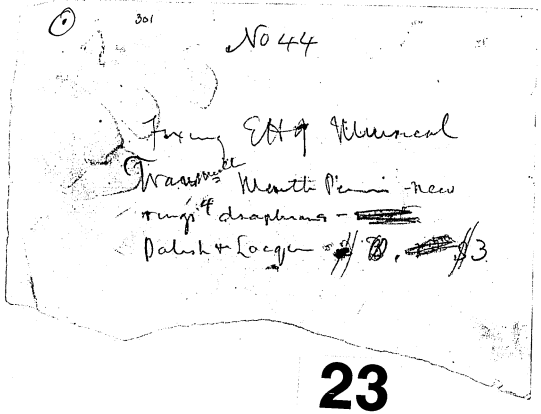
Speaking Telegraph.

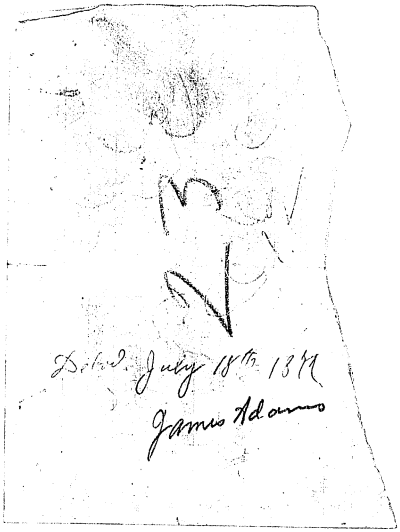
July 17 1877.



X Mica or Rubber Reed for the Mouthpiece

Ticker - Chalk Ball ~~machine~~ Marked in a Concentrated Alcoholic Solution of Aniline Oil Color or other A Color and dried ~~Paste~~ Paste with Dextrine or other Substance to keep Them from flowing Roads These are enclosed in RR Covers for transmit by Mail for use in ~~Key~~ ink places no effect Ball - Bottle Containing water shake and ready for use - Perhaps Arrangement of Pencil pressure would Get better Use of Check -


301
No 44
Transmitter
Polish + Lacquer


Dated July 18th 1777
James Adams

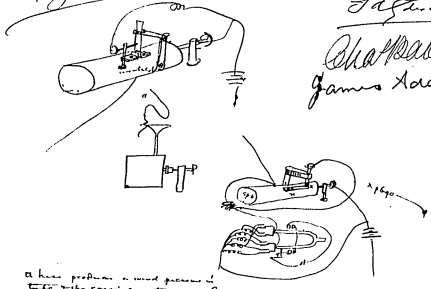
Speaking Electrograph

July 18 1877

Witness

Chas Batchelor

James Adams



A hinged platform or vibrating plate with reeds of different lengths or thicknesses adjusted to the phonetic groups of the human voice is hinged pendulously by a tuning fork arranged to give a number of vibrations per second to the latter.

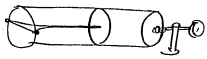
Case Ng 6917

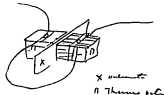
EDISON'S EXHIBIT. 25-12.

262

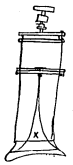
Sply Telegraph

July 18 1877
Chas Batchelor
James Adams

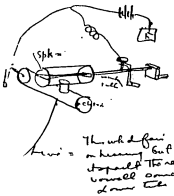




x indicates
n Thumb pcs.



x is a roller mounted to the Central diaphram and the Edges being near a Between the Legs of the end of sply it gets a vibrat which is communicated to the Central diaphram & thence to the line wire The other diaphragm is vibrating near the Receiving instrument as rendered & made to act the diaphragm in motion we just tried an Experiment similar to this



The whole form a Receiving Circuit Diaphragm Through Coil and a Line Wire

just tried Experiment with a diaphragm having an embossing point held against paraffine paper moving rapidly the Sply vibrations we endeavored to record & there no doubt that Sply will be able to print up a reproduction automatically of a faster than the human voice gradually

Speaking Telegraph

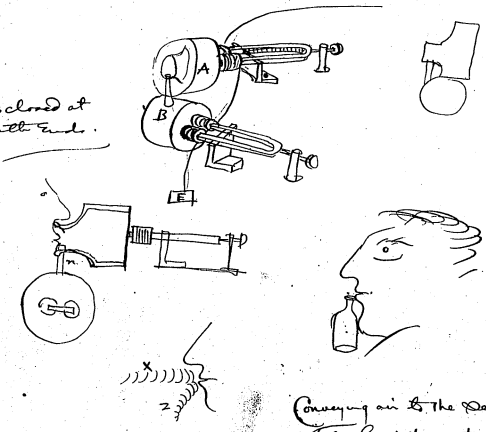
July 18 1877.

J.A. Edison

Chas. Batchelor

Improvement on Bells Magneto Telephone, which improvement Consists in reinforcing the hissing Consonants such as S. T. V. P. C. J etc. Thus

James Adams

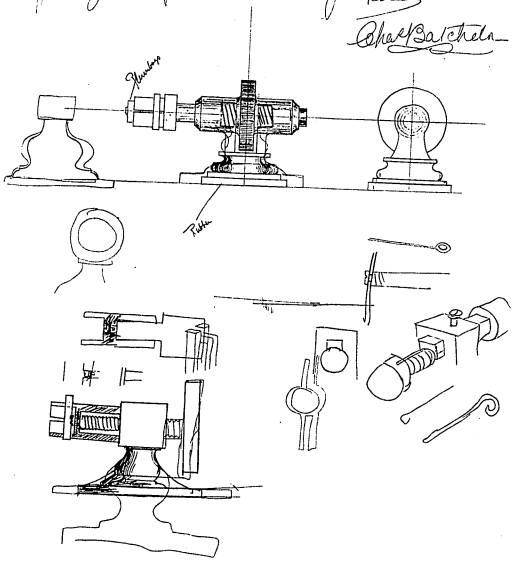

A
B
E
Enclosed at both Ends.
X vocal or vowel vibration
Z Hissing vibration
Conveying air to the Second Telephone through tube A in manner shown acts diaphragm of B in powerful vibration at each vowel sound & thus the vowel or musical sound is obtained from A.

EDISON'S EXHIBIT. 27–12.

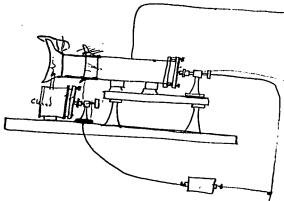
Speaking Telegraph

July 18th 1877

Chas Batchelor



306



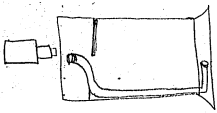
Ryley Blight

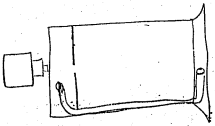
July 20, 1877

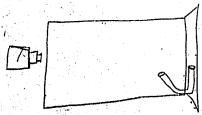
Edison

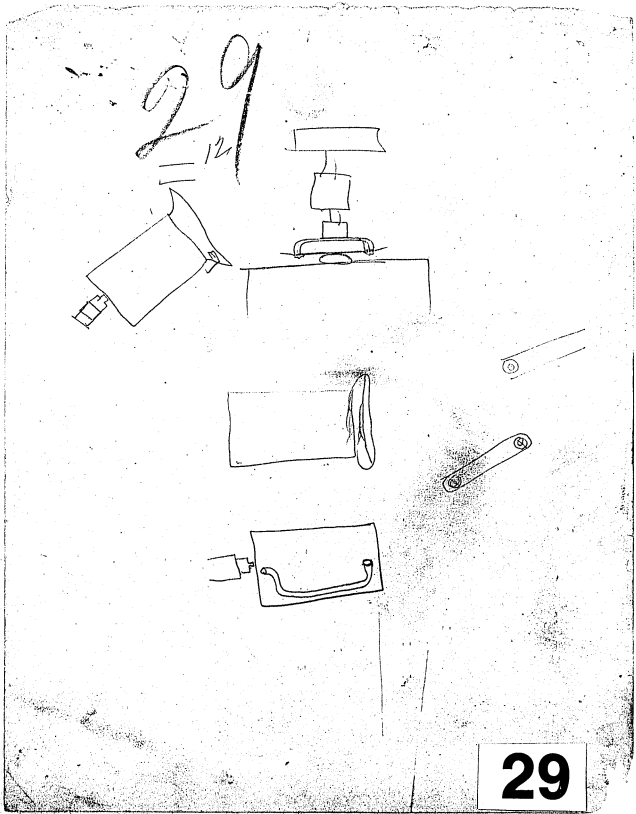
Chas Batchelor

James Adams








29
12

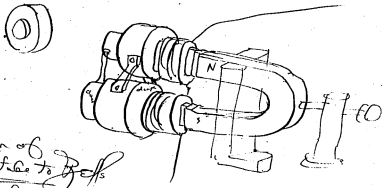
307

July 20 1877

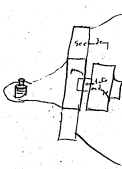
T. A. Edison

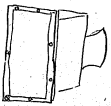
Chas. A. Batchelor

Adams



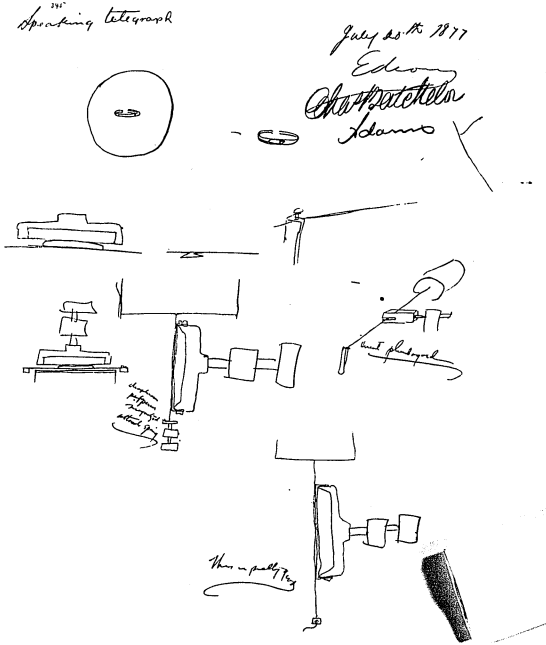
Application of
the Principle of
Magneto Telephone





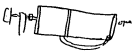
Square diaphragm hung so that
sounds - applicable to Bell +
my own

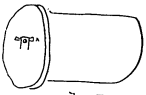
EDISON'S EXHIBIT. 31–12.



EDISON'S EXHIBIT. 32–12.

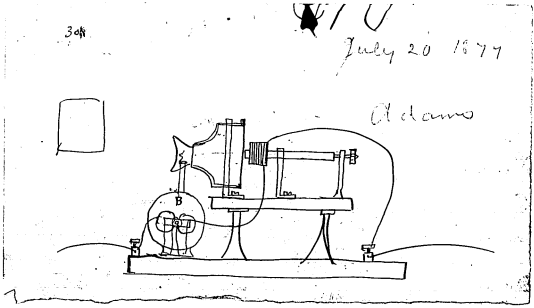
July 20 1877
J A Fay
Edw A Batchelor
James Adams



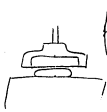


Trim this down [illegible]
A put some paper X would not better

Tried small size gave wood ab plunger no angle ab
tried large size about 2 3/4 wad = heard Bristol sound = no better
a little smoother sound and the wood had four times
~~better~~ No harmonics - this came in with small size
but had a signal clear away few words -
Why due to absorbing [illegible]


3 of 4
July 20 1977
Adams
B

3/0

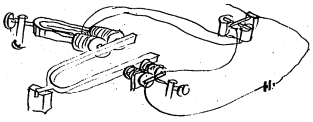


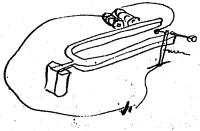
Acoustics

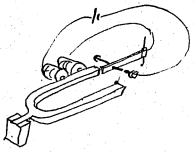
July 20 1877

Thaddeus Balchelder

James Adams



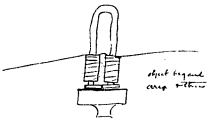




Apkg Telegraph

July 20 1877

Charles A. Tainter
James Adams

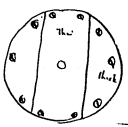


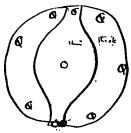
object to speak into distinctly [illegible] magnets pole [illegible] [illegible] [illegible]

EDISON'S EXHIBIT. 37–12.

Speaking Phonograph
Diaphragm

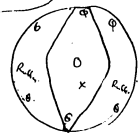
July 20 1877
Th Edison
Chas. A. Batchelor





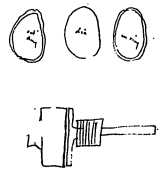
Edisons Exhibit 37-12
L. C.

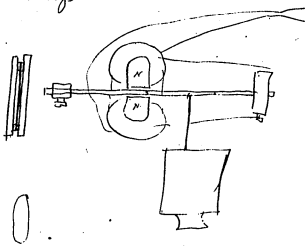
James A Adams



clear varnish ~~of~~ fills diaphragm X.

put rubber at ~~the~~ ~~edge~~ ~~substance of~~ rings between the diaphragm on the rings =





July 20 1877
T A Edison

Adams

Substances to be tested as to their comparative

Box wood
Pine wood
Kings Bi wooning
Ceylon wood
Cork
Celluloid
Collodion
Cardboard various types
Glass
Mica
Copper foil
Tin foil
Gutta Percha
Rubber
Silk
Gutta Percha found in earth
Aluminum
Metal foil
Steel wire foil
Iron foil
German silver foil
paper soaked in various oils
Chamois skin
Kid
Patent leather
Bladder skin Coated U.S.
Ivory
Mother of Sulphur
Yellow amber
Shell
Shellac Coated
Burnt Bark
Rosin
Bamboo
Lemon skin dried
Tobacco leaf
Cabbage leaf
Linen soaked in Collodion

Bone
Ox. Horn & Palm
Tortoise
Linen
Shellacking of paper
Wax paper Coated as in Tissue paper
Parchment
Pin cushion paper
Bank note paper Coated
Papyro graph paper
Mineral Sulphuric acid
Raw hide
Barbata
Papyrus
Tortoise bladder
Platinum
Phosphor bronze
aluminum bronze
Russian Leather
White of Eggs shellaced
oil cloth

3/5

substances suitable for diaphragms

glass
Mica
Hard Rubber
Celluloid.
Collodion.
Aluminium foil.
Soft rubber
Parchment
Parchment paper
Cork sheet
Pith.
~~Gutta percha~~ — good ~~thick~~
Gamma. paper hot saturated solution).
Leather.
Chamois skin.
Cloth
Silk
Pen Stencil paper.
Rice paper.
Japanese Tissue paper.
Skeleton.
Russian Isinglass.
Ivory
Birch bark

July 20, 1877
T A Edison
Signature Pitch
Thos Satchwell
Adams

39

316 2.

39 – Rawhide
40 – Pigs bladder
41 – Fried guts
42 – Parchment
43 – Flattened horn
44 – Five dollar bill
45 – Sheet tin
46

June 20 1847.

Chas Balch
James Adams

320

Box wood.
Pine Wood
Kruzis Veneering
Cedar Wood
Cork
Celluloid
Collodion
Card Board discuzes
Glass
Mica
Copper foil
Tin foil
Gutta Percha
Rubber
Silk
Gutta Percha covered with Rubber
Aluminium
Steel foil
Brass foil.
Soft iron foil,
Paper soaked in various substances
Chamois Skin
Kid

Patent Leather.
Bladder Skin Coated with varnish
Hard Rubber
Ivory
Sheet Sulphur
Tin sheet.
Gelatin Coated.
Birch Bark
Dog skin
Tobacco leaf.
Linen soaked — Collodion varnished
Bone,
Dried Linseed film.
Fish skin
Alkhemmyed paper
Wire gauze with Tissue ppr.
Parchment paper
Bank note paper
Papyrographic paper
Pressed Benzoic acid

42

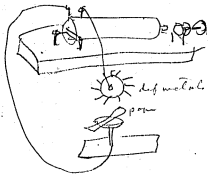
In 16. 9m

July 21 1877.

Experiments to obtain a recording Solution for jump spark for use in determining rate of tuning forks etc

I A Ewing

Chas Batchelor



Iodide Potassium 5 grms 1000cc N O, platina jump spks 1/8 inch wide & vibration fair spark record fair =

1 grm 1000cc Valerate Ammonia = Thallium in one pales tair yellow mark

20 grms 1000cc Com alum Thallium faint yellow mark =

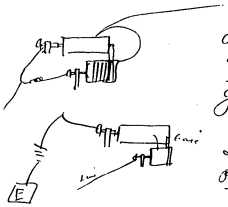
by Telegh =

hired this

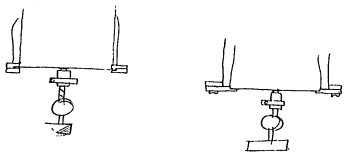
July 21 1877

T A Edison

Adams



Are putting in a way this mica diaphram placed between 2 rubber rings between rings of brass, rings to Going to try a paper diaphram between rings also a diaphram on table of sounding box to Player with the plug permanently on plumb to Taken into the wood Causes motion Edges to vibrate by the Centre would not vibrate but

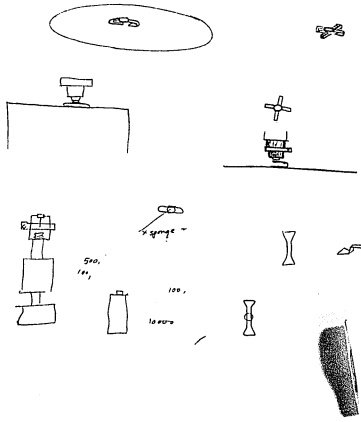


322
Splay Telegraph

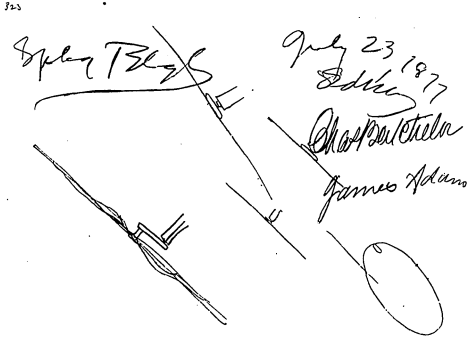
July 22 1877

We find that we must go back T A Edison
to the old Spring arrangement to prevent
Violent Slappage of the diaphragm
then time we put spring on the
Chin

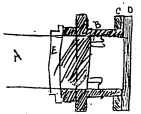
Chas Batchelor
James Adams



EDISON'S EXHIBIT. 46-12.



Kruesi Make an end for talker this
we want a diaphragm 1/8 inch larger 1/16 of inch
put an end on the old tube —



A old tube
B new attachment 1/8 larger
C + D Diaphragm ring
E old collar

Don't increase length any more than
you can help And do not take old instrument
apart till you have the other ready to go in
The sheet B must be screwed to the old tube with
set screws

Batchelor —

July 23 1877

EDISON'S EXHIBIT. 47-12.

335

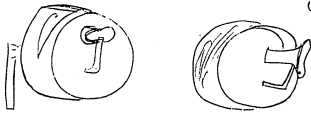
Talking Telegraph

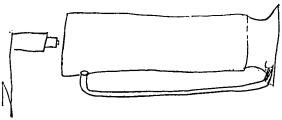
July 28 1877

Edison

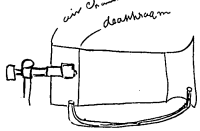
Adams

Chas Batchelor



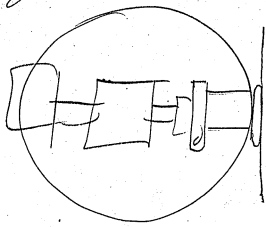


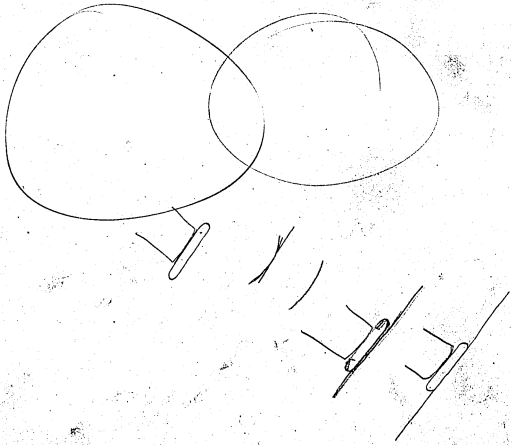
Intended to give everything on the same Deaphragm



326

July 24 1871





327

Spkg Rec'd July 24 (87?

Chas Batchelder

James Adams

flat def J. ... 10 92/100

3 points Gal. 10

learcut 10

41

50

318 Talking telegraph July 26th 1877

Length Rubber 1/2 inch Adams Weight a Tit.

Plumbago 15 Parts with 3 Gram weight

Rubber 1 " Res. 1510 ohms

" 4 Grams " 12410 "

~~Weight~~ Length Rubber Cady 1/4 inch.

Resolenoid with Contact disk weighing 3 Gram = 1700

2d test	1460
3d test	1510
4 test	1680
5 test	1910
6 test	
7 test	1410
8 "	1480
7	10650
	1550

~~on the first sample about 9 grains 73°~~
to 9 deg

now with 1 gram extra

1st test, - 1480

Wire soldering on a Tit

350

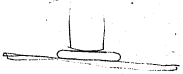
Abraq Telgh

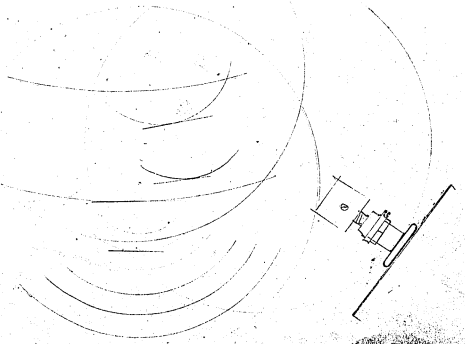
July 25 1877

7 A.E.

Chas Batchelder

James Adams





52

331

Optical Telegraph

July 26 1869

T A Edison

Test of Resistance of Plumbago

James Adams

That Plumbago no Tit = flat. 3 gram Contact pound.

1000 ohm Constant in Circuit = included by Resistance. 1,140
with 10 grams added 1050

now take 10 grams off with no change

Speaking Telephone

July 26 1877

T.A. Edison

Inventor

Edward Peterson

when parties at
each Talk and
one mine & provide
Each one with a
Telephone although
only one can talk at
same time

E

393

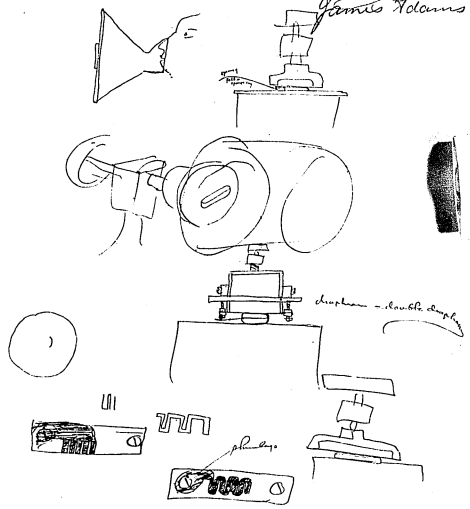
Speaking Telegraph

July 26 1877.

T A Edison

Charles Batchelor

James Adams



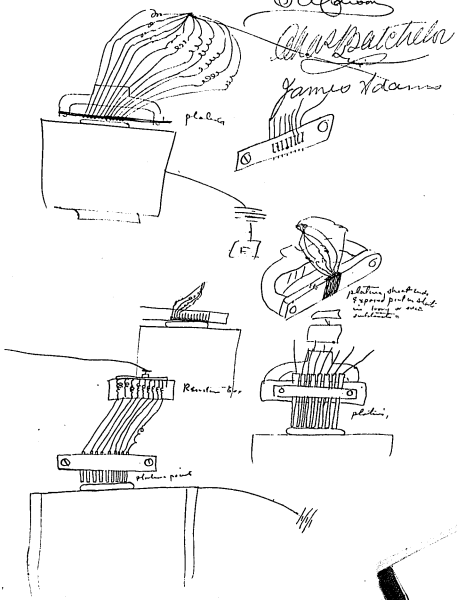
EDISON'S EXHIBIT. 56–12.

Speaking Telegraph

July 26 1877

Chas Batchelor

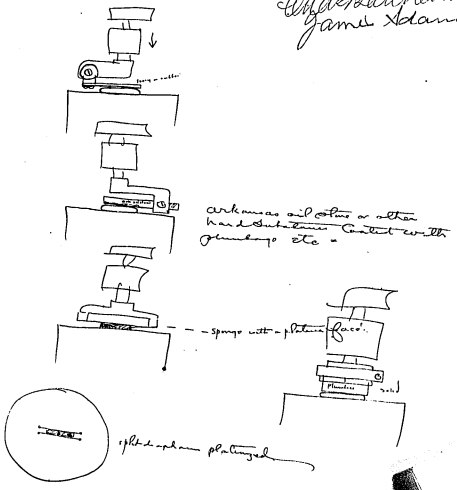
James Adams



Speaking Telegraph July 26 1877
T. A. Edison

or that the plumbago or mica may be put on any surface such as sandpaper of rubber hard or soft wheel and

Witness:
Geo. Gardner
James Adams

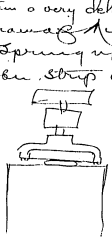


EDISON'S EXHIBIT. 58–12.

Speaking Telephone

July 26. 1877.
Edison

To obtain a very delicate Telephone I make the Diaphragm of a thin piece of very delicate Bone Spring magnet and Coil as Rubber strip with glue [illegible]
Witness
James Adams



Instead of Casting this strip with Plumbago it may be Coated with any inferior Conducting substance such a finely divided Silver or other Metal Sometimes used by Electrotypers to Coat Non Conducting Surfaces It is not necessary that the Reed should be made as shown & described that it may be free at one end that it may be of any flexible substance

337

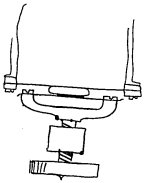
Speaking Telegraph

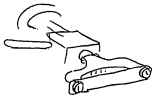
July 26 1877.

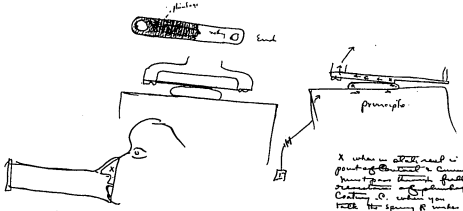
Edison

Thos. A. Edison

James Adams







X is a nose piece screwed to Diaphragm & renders operator upon the diaphragm the vibration from the nose (10) the nasal sound which is heard by the Bell in the Receiving Telephone.

X when in circuit and in position with a Bell Instrument Bell Telephone Receiver and Battery (1) will enable you to hear speech & make more Complete Telegraphic circuit than is now in use. Normal Battery which may be Gutta Percha Cell of

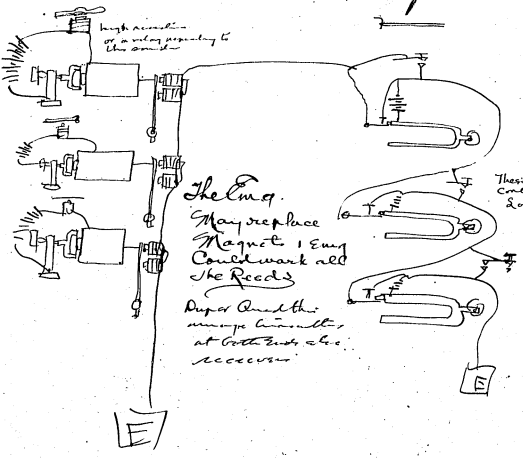
A Couple Telegraph

July 26 1877

To Edison

Mr Batchelor

James Adams


Insert armature or a relay operated by the sounder
The Emg.
May replace Magnet & Emg Coil work and the Reeds
Paper Quality manage between, at both ends etc. accessories
These forks work Controlled by Local magnets
E
E

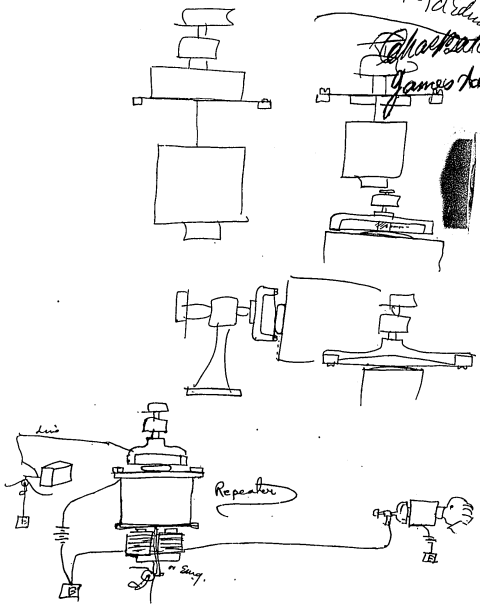
11

60

EDISON'S EXHIBIT. 61–12.

Spkg Relay

July 26 1877
To Edison
Chas Batchelor
James Adams



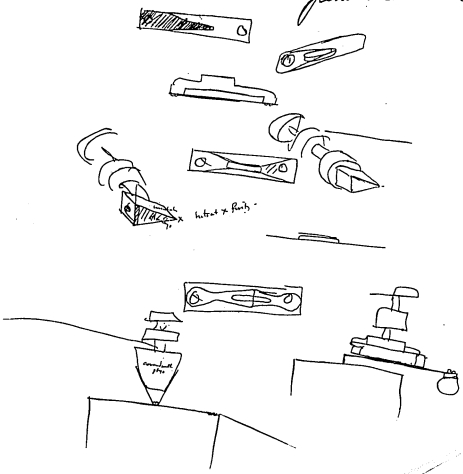
Speaking Telegraph

July 26 1877.

T. A. Edison

W. Hepworth Preston

James Adams



340

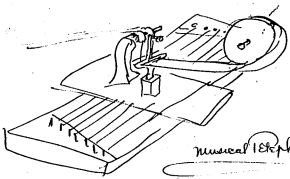
Speaking Telegh.

July 26 1877

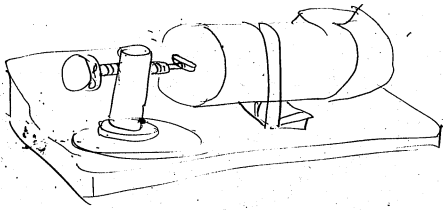
Edison

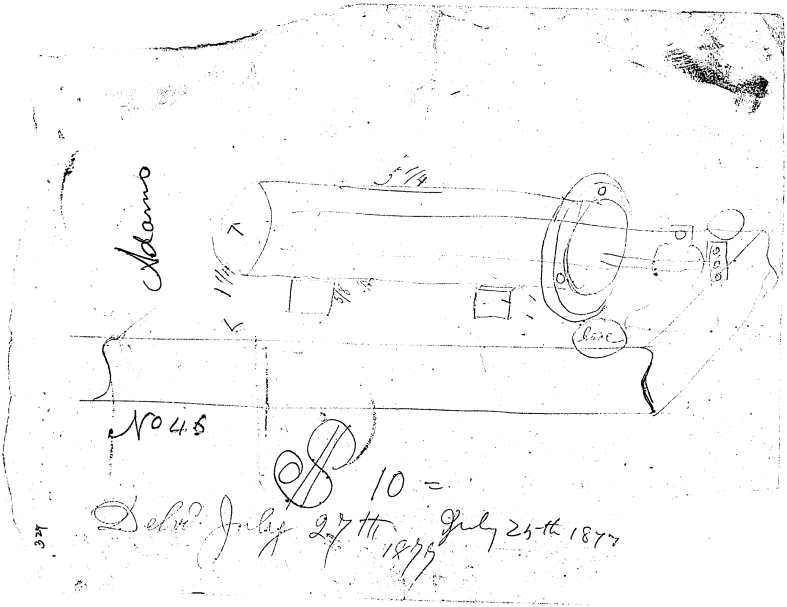
Chas Batchelor

James Adams



Musical Telephone

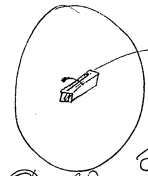



Adams
5"1/4
1 1/16
Chase
No 45
10 =
Delivd July 27th 1877
July 25th 1877

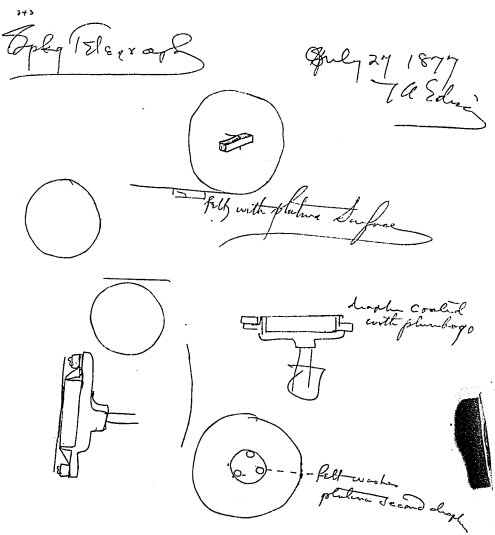
EDISON'S EXHIBIT. 65—12.

342

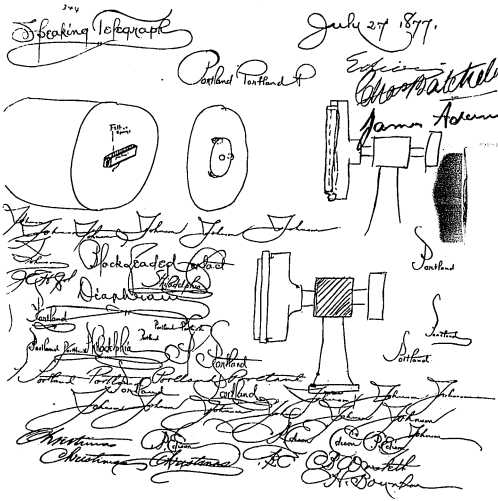
No 45



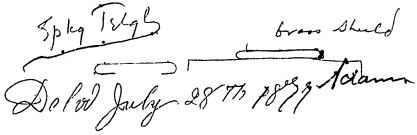
EDISON'S EXHIBIT. 66–12.



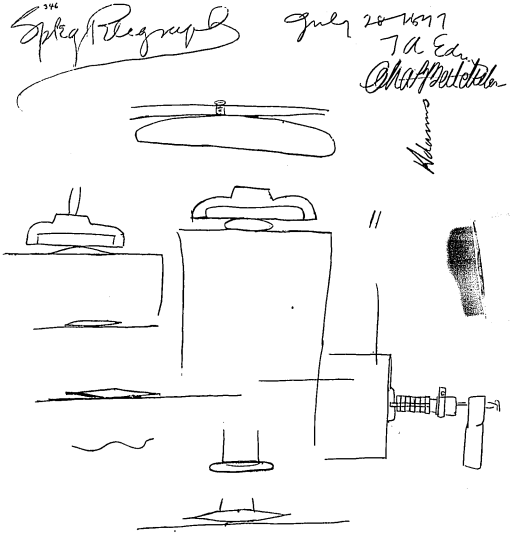
EDISON'S EXHIBIT 67–12.

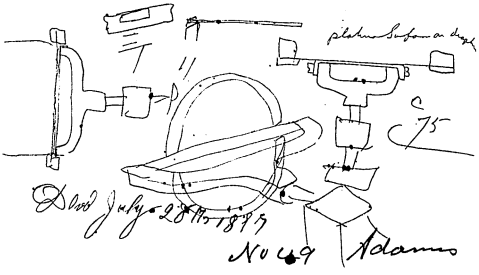


EDISON'S EXHIBIT. 68-12.

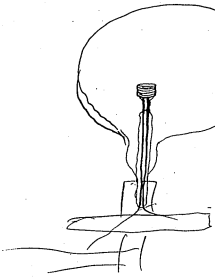


EDISON'S EXHIBIT. 69–12.

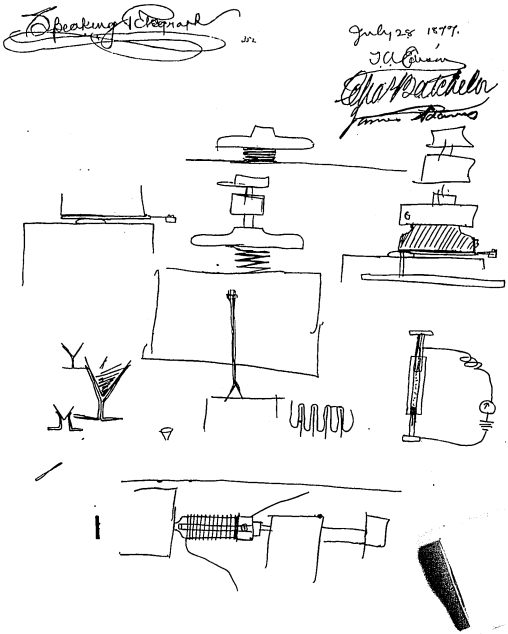



platinum surface on drop
C
75
Dated July 28th 1893
No 49
Adams

FROM THE LABORATORY OF
T. A. EDISON,
MENLO PARK, N. J.
U. S. A.



EDISON'S EXHIBIT. 72–12.



EDISON'S EXHIBIT. 73–12.

No 46

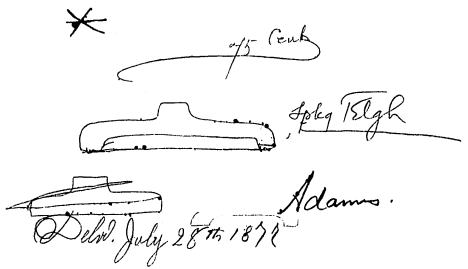
3a Comb

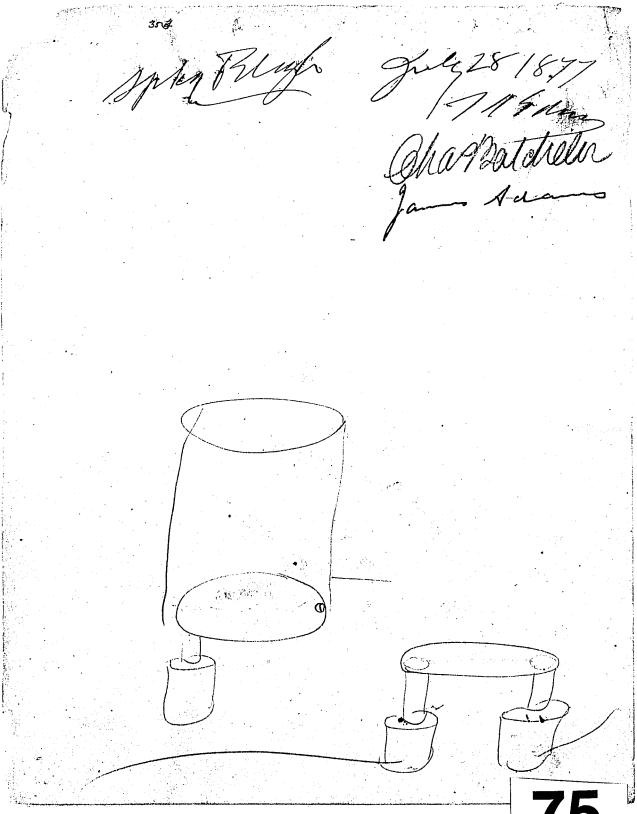
Spkg Telgh

Dated. July 28th 1879

Adams

EDISON'S EXHIBIT. 74—12.





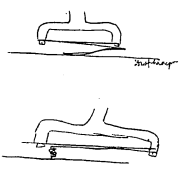
Speaking Telegraph

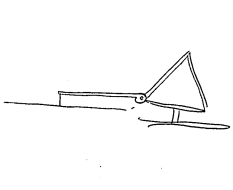
July 29th 1877.

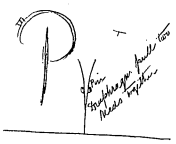
Edison

Chas Batchelor

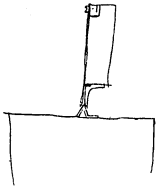
James Adams



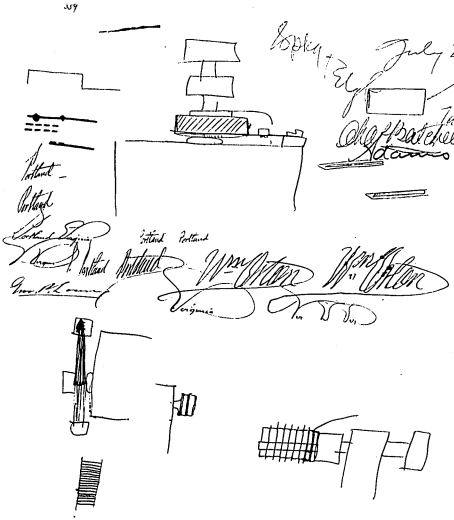


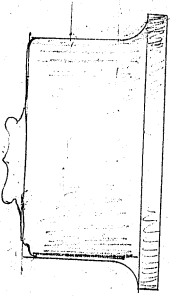


EDISON'S EXHIBIT. 77–12.



EDISON'S EXHIBIT. 78–12.





Sydney Block

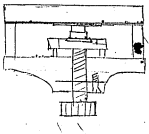
Guilty 29 [illegible] 87

Mr Edis

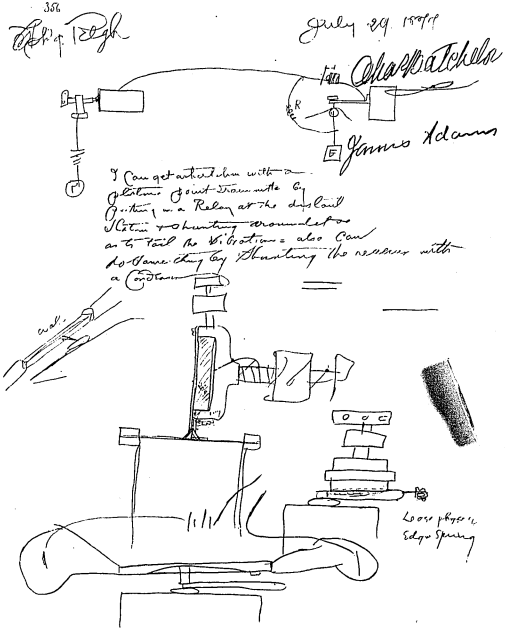
Mr Batchelor

Jas Adams

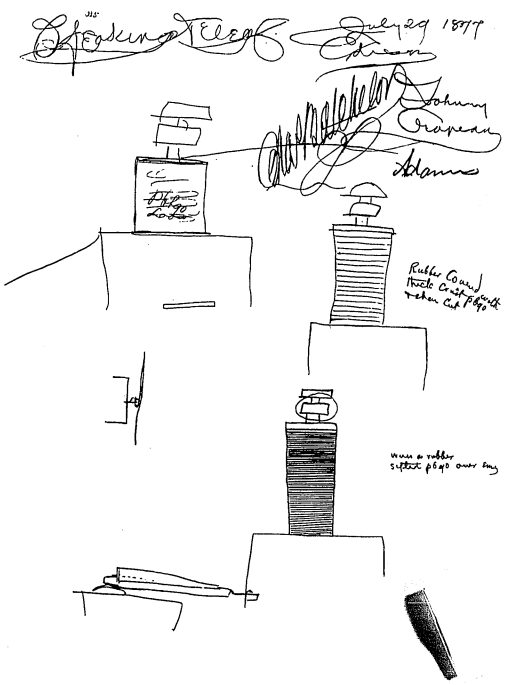
79



79


July 29 1878
Chas. A. Tichels
James Adams
R
D
P
Loose physic
Edge Spring

EDISON'S EXHIBIT. 81–12.



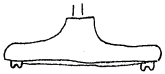
No 46

July 27 English transmitter #10.00/100

July 28. 2 String Lenthagram No 47

8.0 ℔

July 28 ℔



No 48

90 ℔

July 28 Plumbago Paper Inclosed

No 49

75 ℔

No 50

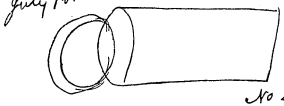
75 ℔

July 28

July 26	Dupk	1 hours Aft
" "	English received	6 "
29	4' "	6
30	" "	13
31	" "	15
		41

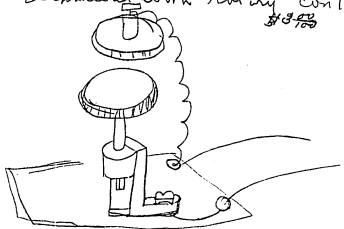
Aug 1st	Received for England	17 hours
" 2	" " "	2 "
2	" Gold & Stock Ask Telegraph	17
		8
3	" " " "	13
4	" " " "	10
5	" " . . .	8
6	" " . .	10
7	" " "	8
		67
8	" " . .	7
"	Fixing Blown off Pole	1
9	Speaking Telegraph magneto	20
10	" "	5
11	" "	10
12	" "	9
13	" "	10
14	"	10
"	Shifting Machinery	3
		75
15	Magneto Telegraph	14
16	" "	14
17	" "	14
18	" "	10
19	" "	19
20	" "	4
"	Sewing Machine	1
21		13 Erasures for Pay forms
2	Johnis one Diaphragmes	1 Kilburn & Plume 2.8.P
		~~66~~ 91

July 14th



No 42

Experimenting with Rotary Contact Points



July 14th Aluminum & Platinum Plates Experiments

No 43

July 4	Plumbago cup & Mould		8 hours
5	Edison Gold Stock		8 "
6	"	"	13
7	"	"	10
8	"	"	10
9	"	"	13
10	Repairing Engine in Shop		6 —
"	Edison	"	7
11	"	"	13
			90

EDISON'S EXHIBIT. 83-12.

July 12th	12 hours
13	13 "
14	8 "
15	6 "
16	13 "
	52

17 Speaking telegraph with S. H. Attachement — 12 hours

18 — 11

23 hours

18 fixing E. H. Johnson transmitter

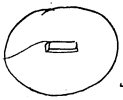
No 44 # 3 ov 150

July 19 Speaking telegraph with S. H. attachment

" ~~8 hours~~ 8 hours

20	~~22~~	22
21	screw Drivers	6
"	Speakin Telegraph	4
23	Dephragm	10
24	"	10
25	"	10
26	"	1
"	Patterns England received	2
27	" " "	3
"	Johnson Dephragm	1
		75

July 27

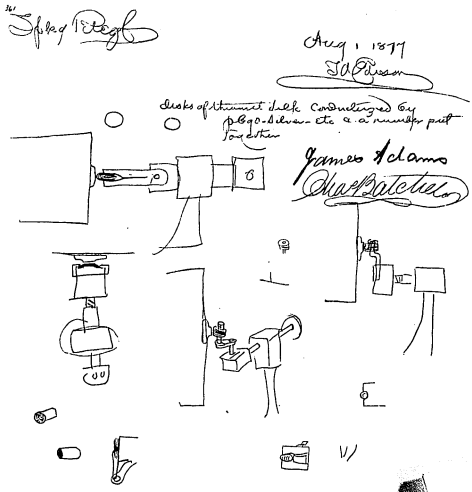


Dephragm with felt under Platina

25¢

No 45

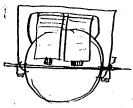
EDISON'S EXHIBIT. 84–12.

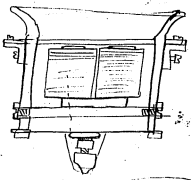


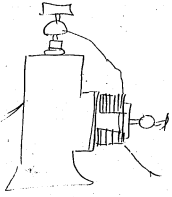
Speaking Telegraph

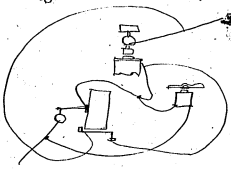
Aug 3 1877.

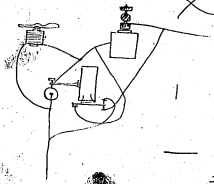
Mr Bell
James Adams

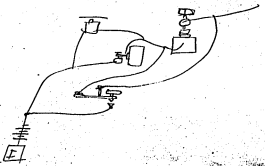




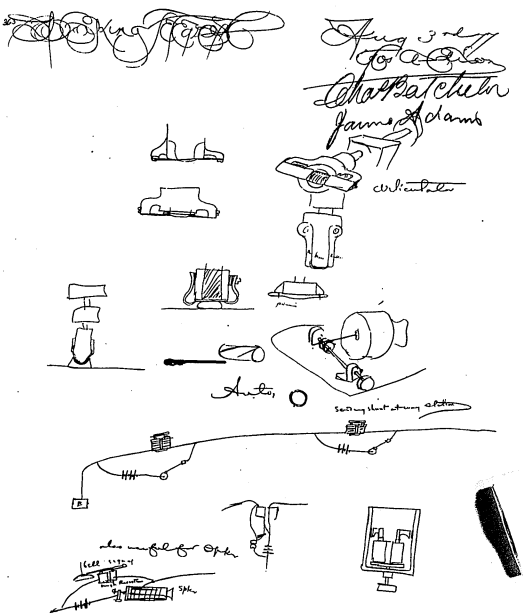








EDISON'S EXHIBIT. 86–12.



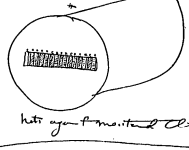
Speaking Telegraph

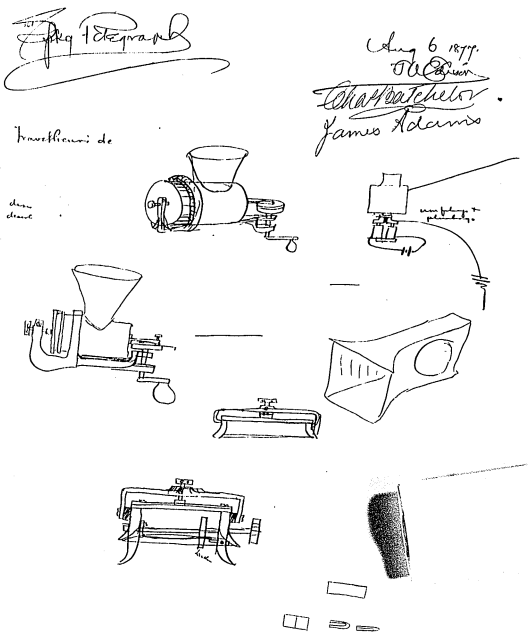
August 5 1877

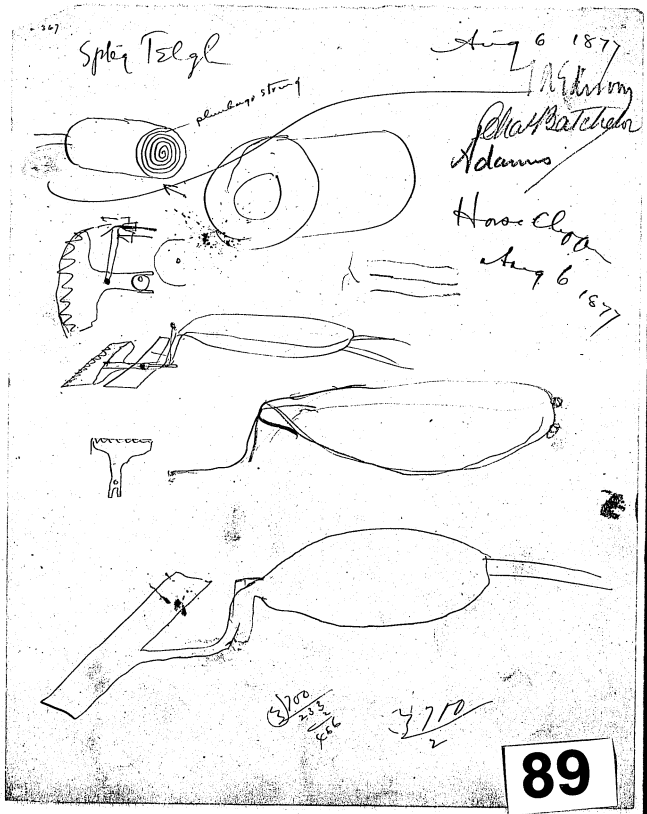
T. A. Edison

If a thick Sponge having its pores well filled with plumbago finely divided metal or Conducting oxide or Carbon is pressed flat into a Circular Cavity as an ordinary Button and then a Platinum Contact Screw adjustment be made with Carbon Button it will prevent from Caking that generally occurs in Loud.

If a Disc of Carbon & the Button Cup & the platinum on the diaphragm is permanently Coated with Some Conductor Carbon or oil or Asphaltum Gum & fine fibre with plumbago or other semi Conductor used that we get two rough boards which when fast together give very fair electrical

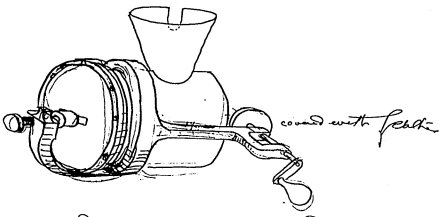





Splay Tel gl
Aug 6 1877
plumbago string
Hose clip
Aug 6 1877
89

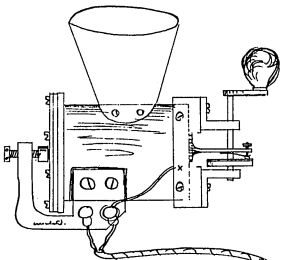
EDISON'S EXHIBIT. 90-12.

366



Aug 6 1877 Pocket Speaking Telegraph Edison

Adams



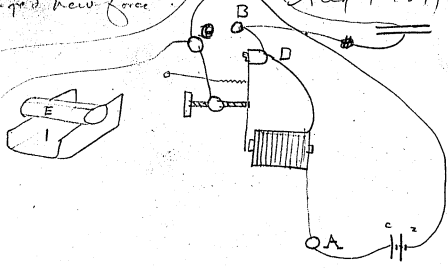
× end speaking - Rubber diaphragm

Portable Speaking Telegraph

August 6 1877.

Parker's Alleged New Force

Aug 7 1877



alternations [illegible]

Relation Telephone

only due to Effect Extra Current

Same as if experimented with [illegible]

92

EDISON'S EXHIBIT. 93–12.

Aug 7 1877

If I should with the Sensitive Articulate Phone it would seldom you Can put in a Metallic Diaphragm without hearing the ringing sound of the Vibrating Metal (2) harmonic Due to inequality in flute, But by using Mica or other no ringing Substance the effect is obviated & the Instrument is very important as the ringing sound to decoying quadruplexing & other valuable to deceitful & Telephone would be nonsense Without patent Leather to get rid of Others of Course the dud but veils of Doubles Should require adjustment to give proper movement or tone Softness enough to Compensate upon Carbon Delicacy material turn to make a success such substance as wood Mica – Vulcanite &c must & think be used although soft metals like gold & platina might be used

Chas Batchelor
James Kenny

EDISON'S EXHIBIT. 94–12.

Speaking Telephone

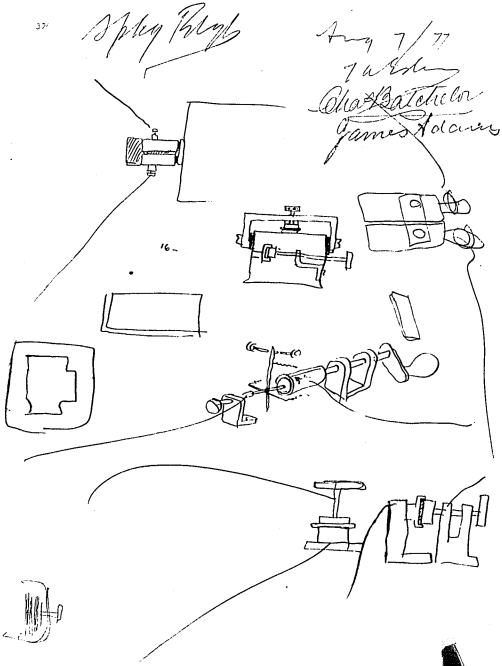
Orange N.J. May 7 1877

Chas Batchelor

I find that if the magnet and diaphragm are set up in short lengths of iron and the mouthpiece and all the parts carefully turned the plumbago will often produce very good articulation. I find that a good loud sound of speech tends to destroy it necessary to use the slot in the mouth piece. Even in the new Speaker the loud sounds destroy the sharp edges of the slot somehow we cut into strong vibrations of the diaphragm and Circuit.

James Adams

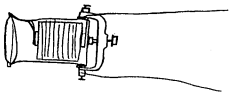
EDISON'S EXHIBIT. 95–12.

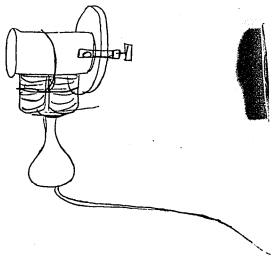


EDISON'S EXHIBIT. 96–12.

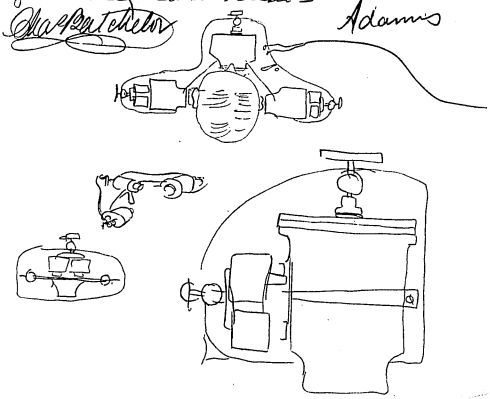
August 9 1877
T A Edison
Witness
Jas Adams

distant box with key to call & telephone in box to tell who is at & what is wanted also call bell in box & the code used to call person where box is from Central Office



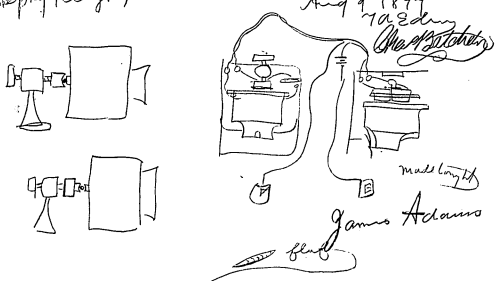


Topkq 9 2 q h
Aug 9 77
Dingfield all Dong hand 40 Cadland
15-ohm Dander mag mnt dipster
way wire turns Ukiah track 69 mile -
got ordinary Camera station =
Adams

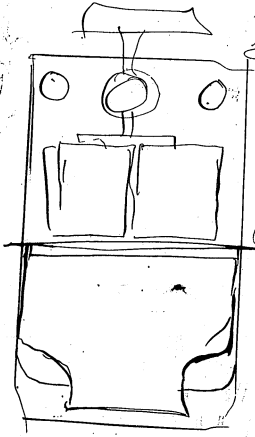


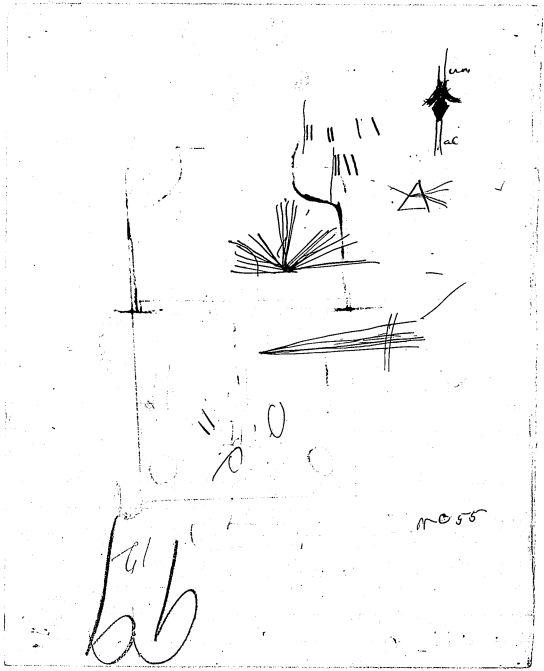
Stylus Telegraph

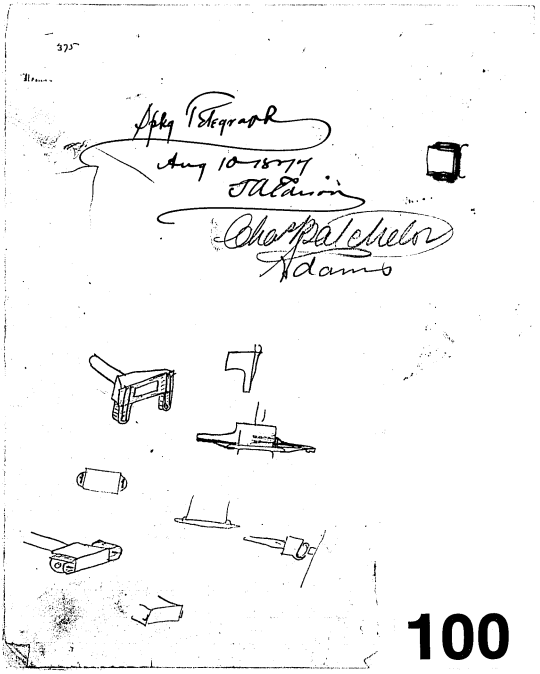
Aug 9, 1877
Thos A Edison



Take unexpan cork & pick it out radial fashion with knife leg straight & close then take sharp pair scissors & cut it off in pieces about ½ inch long then plumbago if so roll it up in cigar shaped rolls & place in the grooves straight by wind after rolling with a long single fibre to hold it together until cemented like a cigar. The magnetic recess of wood tube & two diaphragms which prevent from ringing or after vibrations by two deadening rubbers or equivalent Cardboard pressing diaphragm inwards or outwards as case may be. Tested Magnetic Recess to Mag & Back to Longit

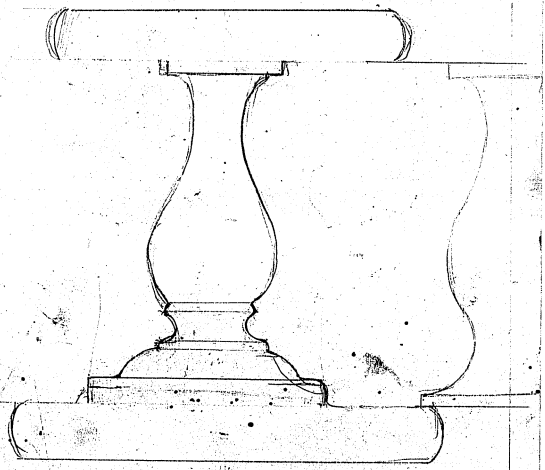

Telephone




Aug 10 1874
Adams
Adams

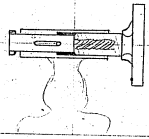
Speaking Telegraph
Circ 11th 1877

Chas. G. Batcheller

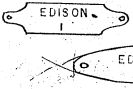


Reading Telegraph
Aug 11 1877

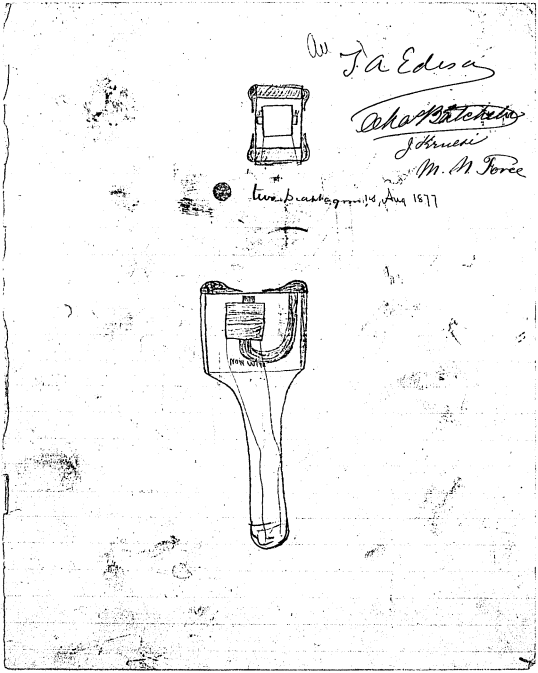
Edwin Holden

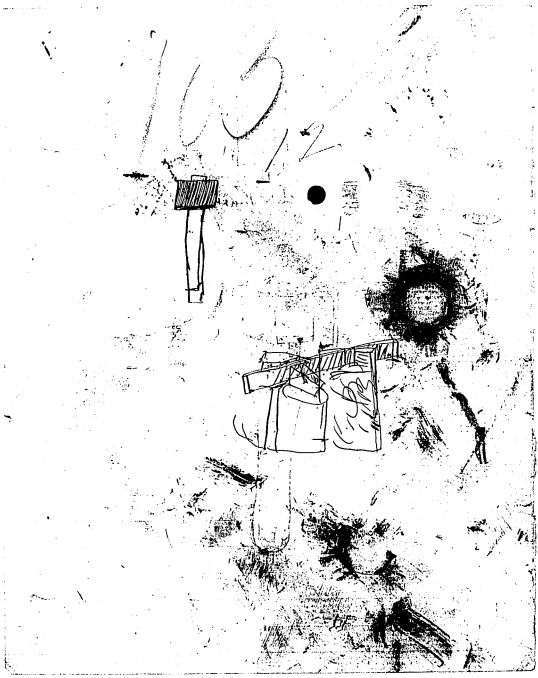


Apparatus for
magnet & armature



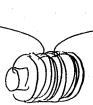
102


To Edison
Charles Batchelor
J. Kruesi
M. M. Force
Menlo Park, Aug 1877

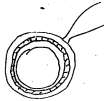


Syphy Telegraph

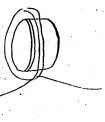
Aug 12 1877
Patented
Alexander Graham Bell
Thomas A. Watson
James Adams



wire tube wound with wire



cotton magnet having its core formed of disk of iron vibrating connecting by two arms



wood of mouth

Insulation between the conducting fibre can be dispensed with in my telephone and equivalent described (14) the clean fibre may have a semi conducting substance included in its folds & thus work well

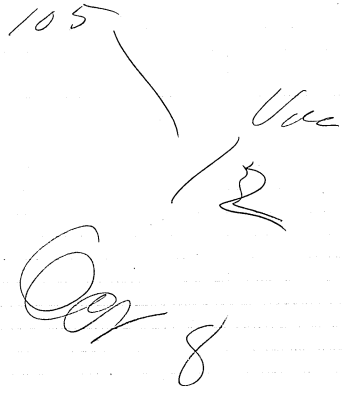
Even lead plumbago or equivalent will work etc

Loose plugs or Mercury or string rest on a opening in or top of felt sponge felt or other suitable or string be used with free length from one plug & a pencil through point connected or diaphragm it will adjust it

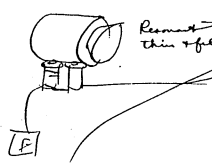
accurate tuning of each reed by plugging the cavity with cc

T. A. EDISON,

Menlo Park, N. J., *1880.*

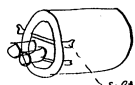


Aug 12 1871.
Thos A Edison
Witness
James Adams



(Edisons Exhibit 105-12 L.C.G.)

with few filings or few filings, or less even.



soft rubber to deaden the diaphragm should well pressure however or excessive under the hand piece of Bell or equivalent may Could be placed in different part of the diaphragm + shell so that by adjustment seems to dampen it =

x is piece dry paper with few filings, not to fill with sand

diaphragm with contacts

ample paper

x rest piece going close
to diaphragm

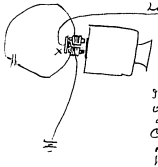
378 Speaking Telegraph

Aug 16 1877

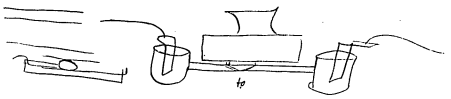
T A Edison

Geo Barker

James Adams



I place an armature on the diaphragm & it acts as a moveable yoke or back. The armature X is arranged with pieces of Conducting fiber brass pegs, wire or other device for increasing & decreasing the resistance by a movement and the movement of the yoke on the diaphragm causes the Electric current which is in a Circuit with it to correspondingly weak as it approaches & recedes from the magnet thus causes the armature X to be attracted & repelled & vary the pressure on X



350

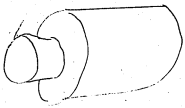
Spkg Eagle

Aug 17 1877

J. C. Adams

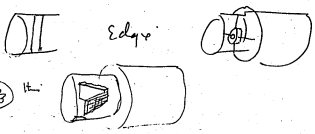
Chas Batchelder

James Adams

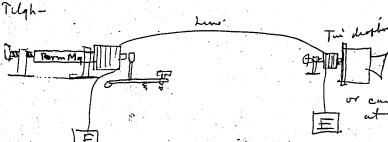


I find that the B. P. F. V. give wind rushes different from C. G. H J S T X Z

The Slot in the Mouth piece is different from the Latter but the other rushes go directly in take heave I propose to put something in like having sharp edges to Cut the wind which rushes in so will not downward like the "Ah" it can be



New Tilgh-



581 Epley Rleigh

Aug 17 1877

7 a Edison
Chas Batchelor

In my apparatus for recording & reproducing the human voice - I propose using a paper coated with a substance which becomes very soft by heat & when cold is solemly hard like sealing wax,

James Adams

I think a Parkes diaphram both for recording and sending is the best thing we have yet struck, an account of an absence of harmonics

Phonograph.

Paper is previously embossed and brought to a knife edge. then the little point on the diaphragm having a knife edge only has to indent this edge which it ought to do very easily.

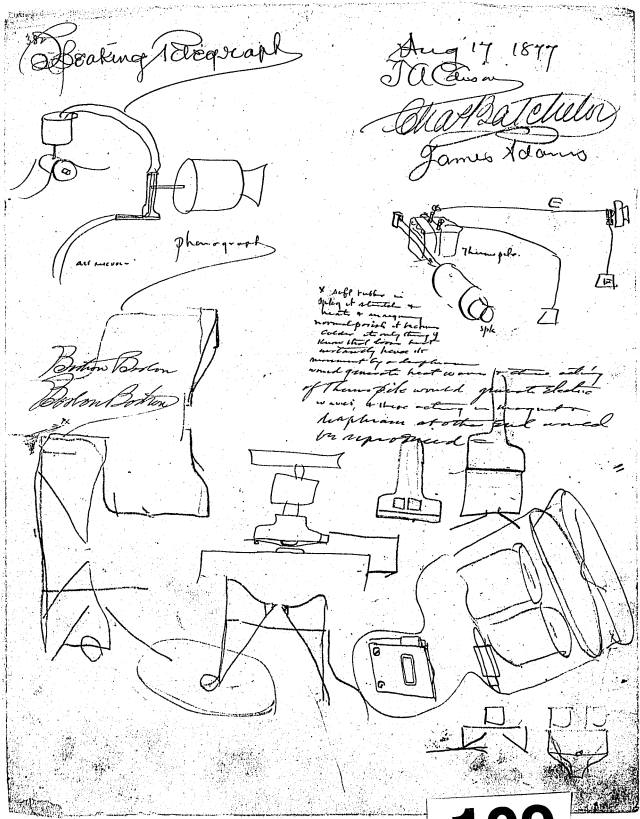
The Edge may be a substance deposited on it

if this embossed edge will work. the speech may be retransmitted, over a telegraphic circuit,

Another idea. Indent the paper in spiral grooves as on a long strip. Cover whole of paper with tin foil. the point on the diaphragm will then easily indent —

108

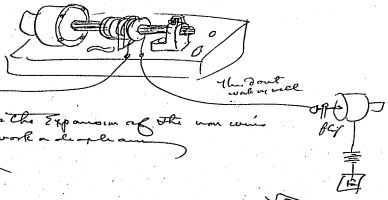
108

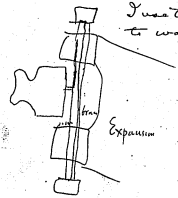

Speaking Telegraph
Aug 17 1877
James Adams
phonograph
Thermopile.
Bottom Bottom
Bottom Bottom

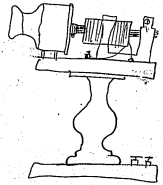
109

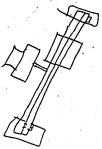
Aug 17 1877

Hg in flat dish with a chem solution. I claim setting a diaphragm in motion by a movement derived from the action of Electrolysis on Mercury.







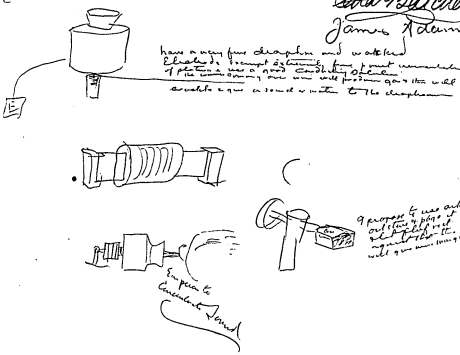


110

EDISON'S EXHIBIT. 111–12.

"Speaking Telegraph

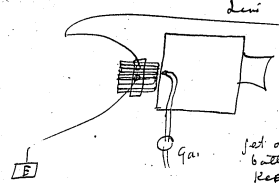
Aug 17. 1877
U. Edison
Edward Batchelor
James H Adams


have a ways four diaphragm and watched
Edward's prompt diagram
9 purpose & uses ask
Fig. lower cable drop-
Fig. 2 shows Cabinet

Aug 17 1877

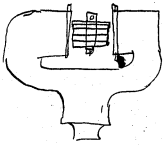
Talking Phonograph

T. A. Edison



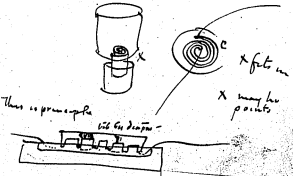
James Adams

Set of gas platinum wire kept hot by battery and many other means keeps the metallic diaphragm hot thus subjects in closer proximity to air exceedingly delicate thin pole connected to the iron, perhaps something cool at the other end wound by wire



both diaphragms kept hot or one kept hot other cold or can use two diaphragm both one is always naturally colder than the other

NO



112

EDISON'S EXHIBIT. 113-12.

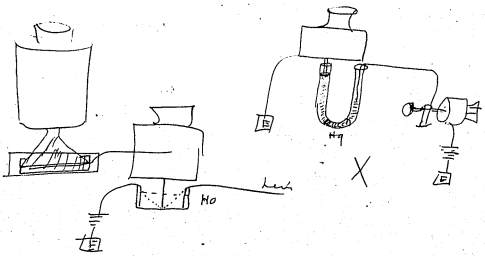
Aug 17 1877

Plug corked with a Sawyer Cork or wood plugged in a bottom 3 inches deep from which [illegible] a portion of the [illegible] is cut off [illegible] to [illegible] the [illegible] of the cork.

Spoke Bligh

Aug 17 1879
J. A. Edison
Orange Jefferson
Adams

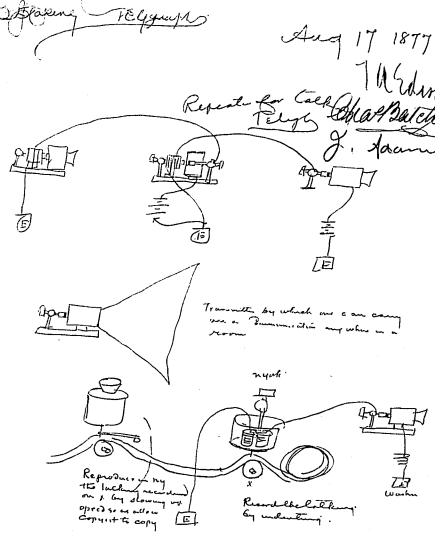
Iron tube closed ends Co wound with wire, talk into it sets wheels turning vibrating armature permanent magnets Current



X is an attempt to use the capillarity movement of mercury to work a diaphragm.

Spherical flask work good if sound made thro wh ok

114

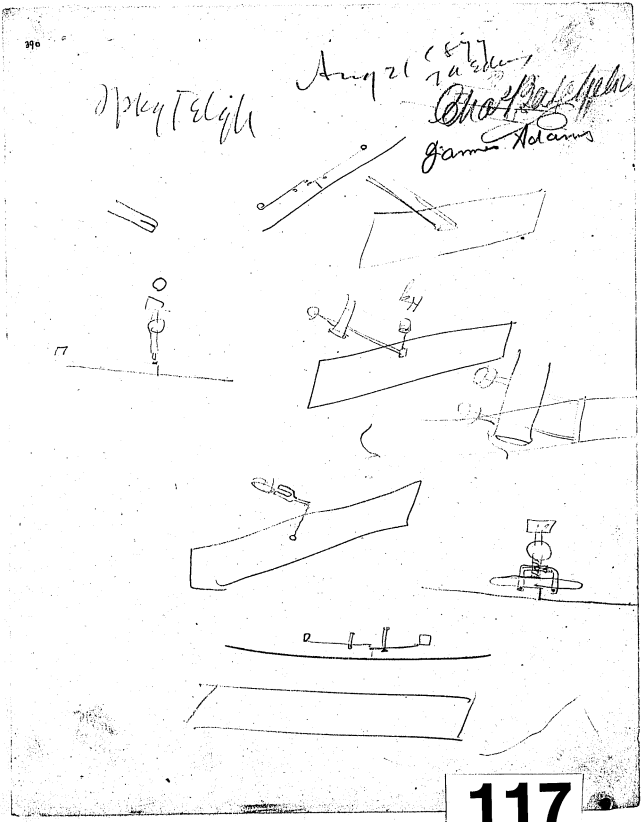

Aug 17 1877
T A Edison
Repeats for Calls
Telegh
Chas Batchelor
J. Adams
Transmitter by which one can converse as in Telephonic way when in a room
Reproducer by which the Telegraph is read by sound
Recorder by which the Telegraph is recorded by indentations.

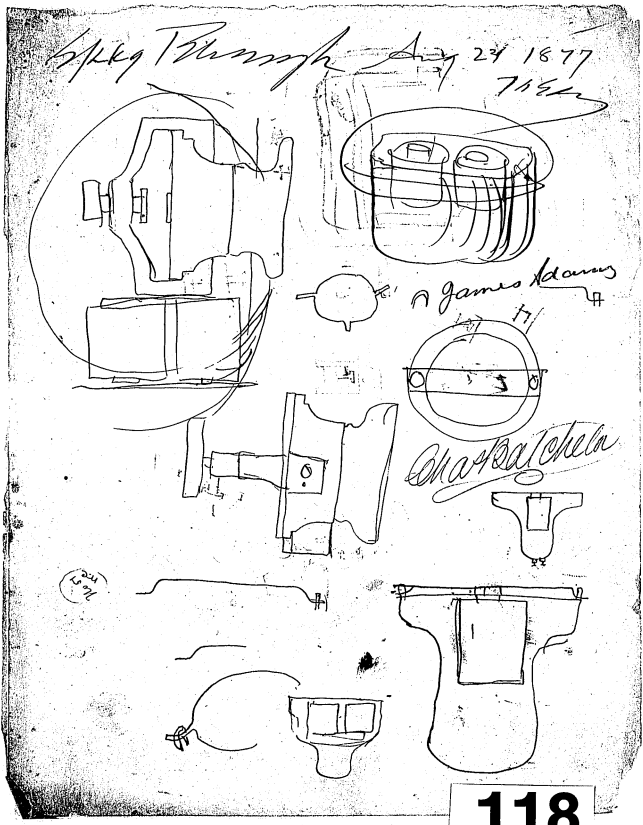
Experiments on Speaking Telegraph
Aug 21st 1877

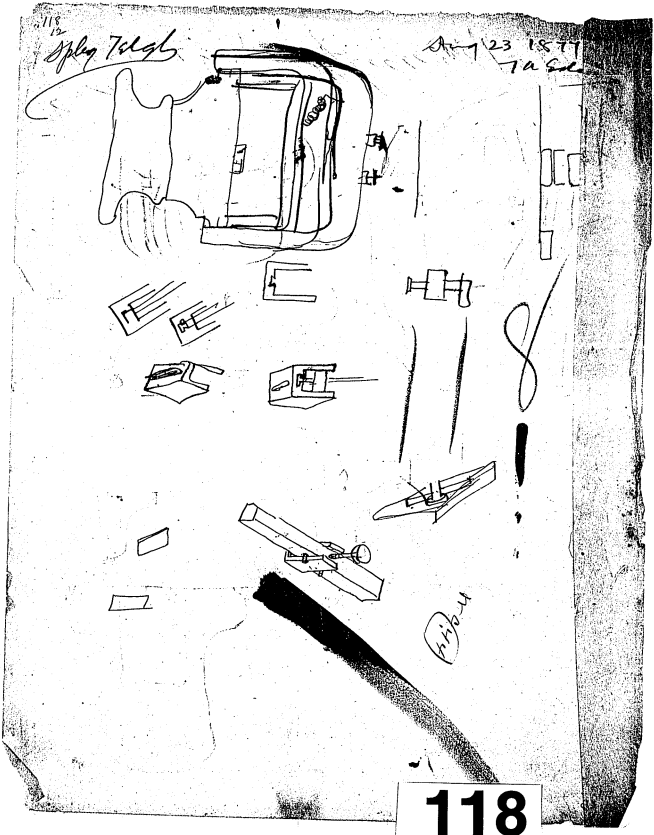
Chas Batchelor

No 1 Fluff good articulation reads at ~~1800~~ ohms
— good articulation with 2 instruments

2 No good
3 No good
4 Fluff good articulation — 300 ohms
5 — — — best — 1800 —
6 — — — 2200 —
7 is mum
8 — — 3000 ohms
9 — 1000 —
10 — 12000 —
11 — 6800 —




Aug 24 1677
James Adams
Charles Chelsea

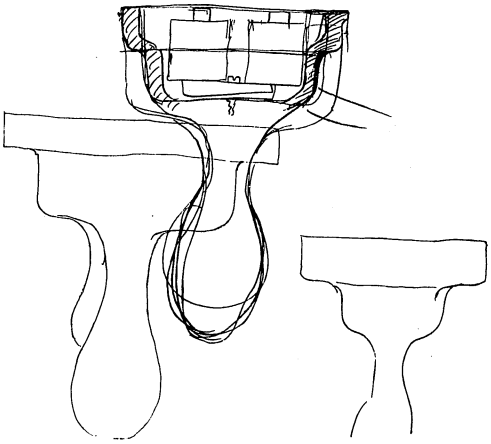


118

Speaking Telegraph

Aug 24th 1874

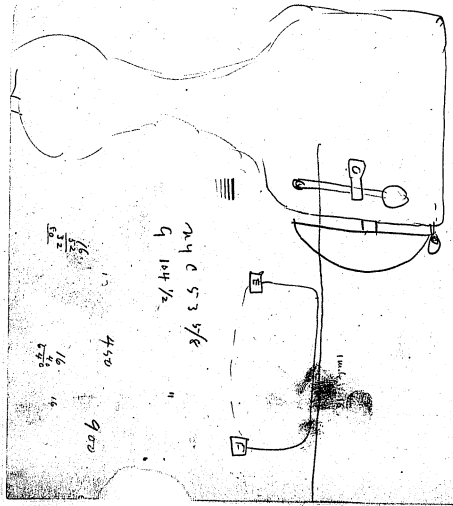
Chas Batchelor
James Adams



Speaking telegraph

Aug 24th 1877

Alex Bell
James Adams



120

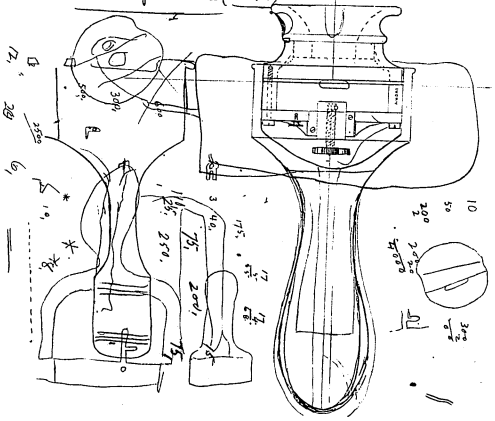
The Speaking Telegraph

Aug. 24 1877

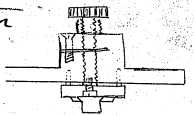
Chas Batchelor

To fasten shell + handle put pin in periphery of frame & have small piece of brass in inside + cut out as

Make connections on inside and take through handle with flexible end (double)

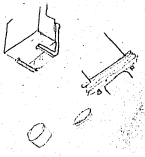


Speaking telephone

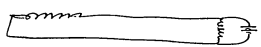


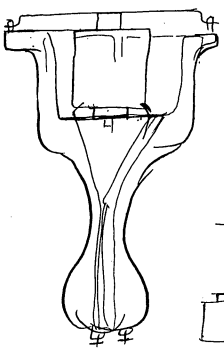
Aug 24th 1877

Chas Batchelder
Adams

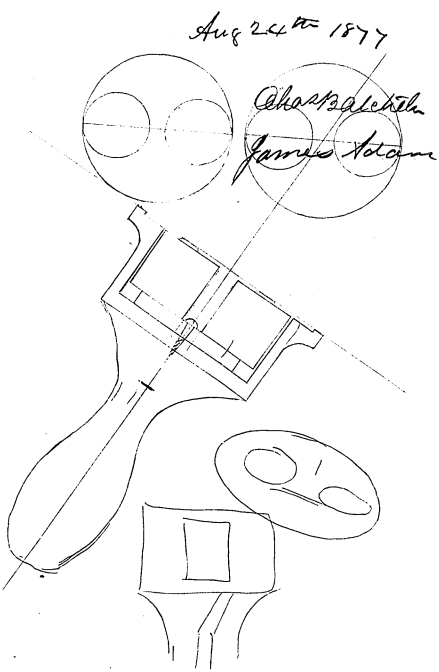


341





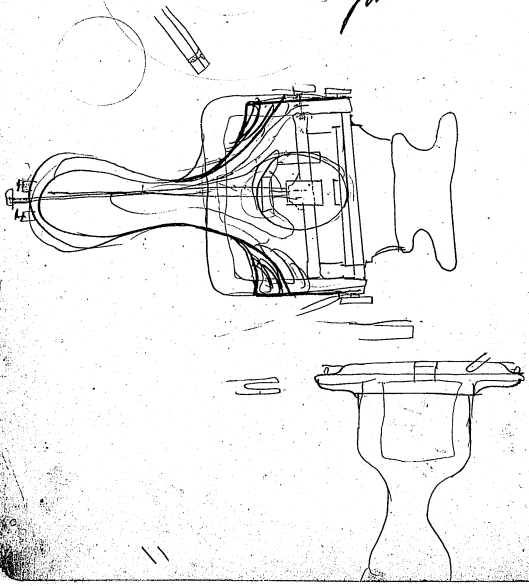
June 24 1877
Tal Edison
Charles A. Peterson
James Adams


Aug 24th 1877
Chas Batchelor
James Adams

Speaking Telegraph Aug. 24 1847

Chas Matteson

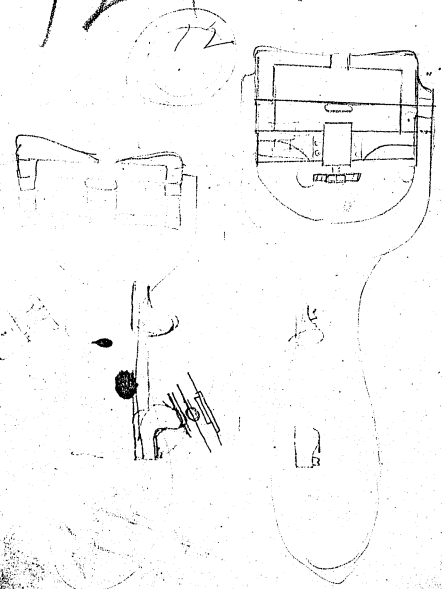
James Adams



126

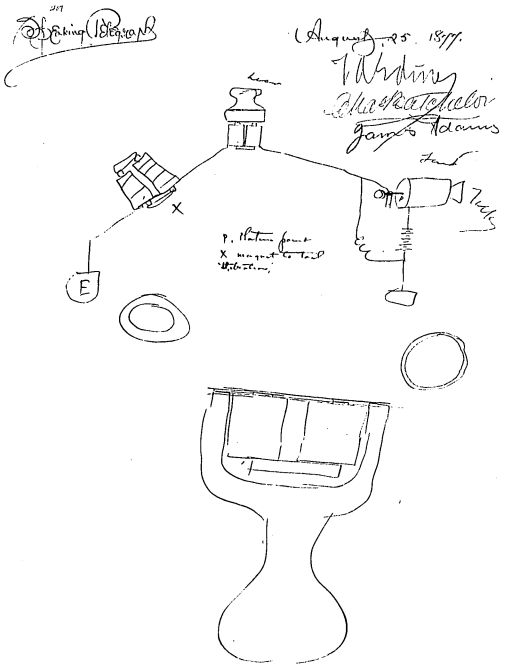
Spring Bldg

126

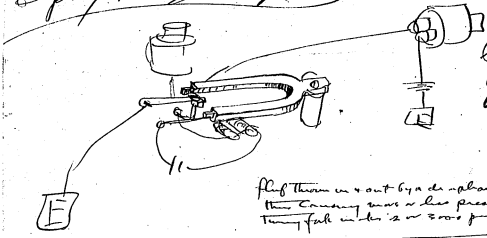


126

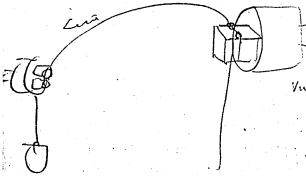
EDISON'S EXHIBIT. 127–12.



Aug 25 1877



Plug Thermo in + out by a de-galvan.
Then Cautery moves w less pressure
Then Tank in this is w 3 more per second



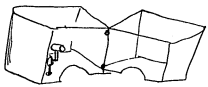
Vulcanite daughter
Thermo pile

EDISON'S EXHIBIT. 129–12.

Aug 25 – 1877

It probable that Iron could be condensed Upon a metal surface by Telephonic fibre thus making Thorn Conductors.

I propose to have one Receiving Instrument with a no of Gold Cups & Each Cup is connected to a battery or Coil out of Circuit passing to Receiving Electro Magnets which Sounding Rods Strike, thus would represent the Sound Waves uttered by —

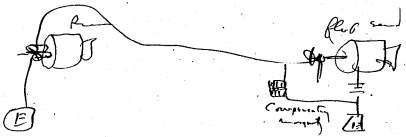


Hinged Box made of wood in which is Telephone opposite thus to be used in noisy places the head of the person Talking, or Phonograph is placed 6 of —

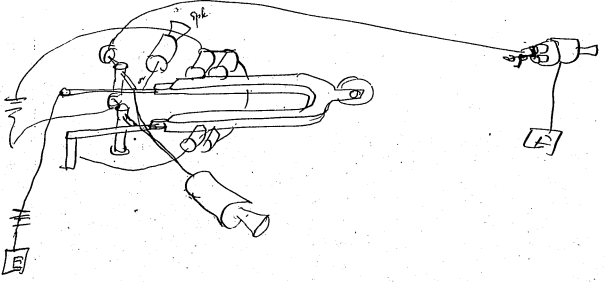
Speaking Telegraph Aug 25 1877

Alexander Graham Bell
Thomas A. Watson
James Adams

Use a resonant diaphragm or plate composed of a large number of thin iron sheets or plates the vibrator harmonics—



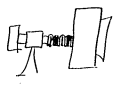
feed a number of Telephone wires out of one battery.



130

EDISON'S EXHIBIT. 131—12.

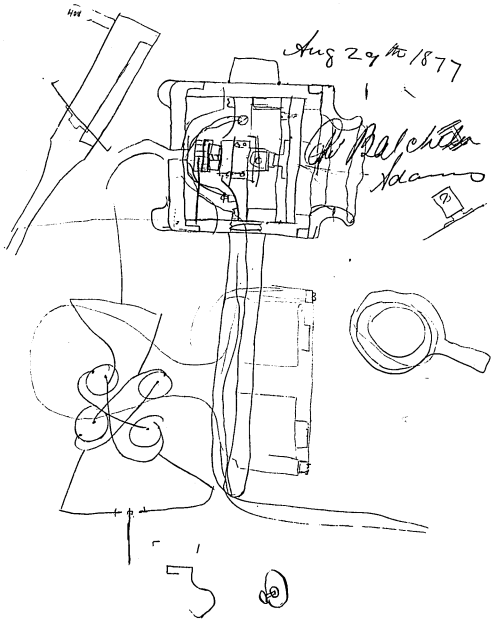
No 2
Stock Telegraph



Small Letters

August 25— 1874
T. A. Edison
Chas. A. Gardner
James Adams

EDISON'S EXHIBIT. 132–12.



EDISON'S EXHIBIT. 133–12.

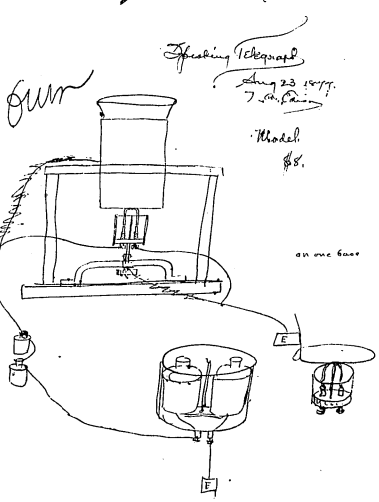
Dated August 30th 1877

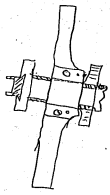
Speaking Telegraph

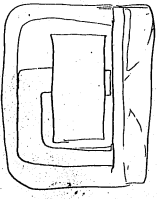
Aug 23 1877.

Model

No 8.







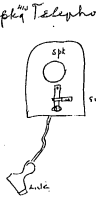
Improvement on Bells
J. Clephane, the daughter's Husband
Galary of the Otter
End of the permanent magnet

Spkg Telephone

Domestic Rec

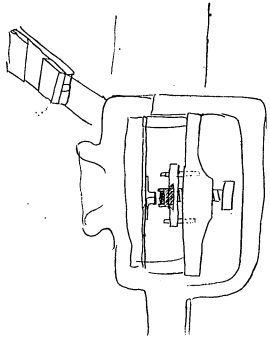
Aug 30 1877

To Edison



The Telephone Call of James Hogan
to four Boxes and one Door
Signalling Apparatus for
Ringing Bell Engine etc
I propose to include it with
Same Circuit with the Gile
Signalling apparatus short
Circ the Bell & Receiving
magnet only when talking.

Chas Batchelor



T. A. EDISON.

Menlo Park, N. J., *1880.*

Doc 12

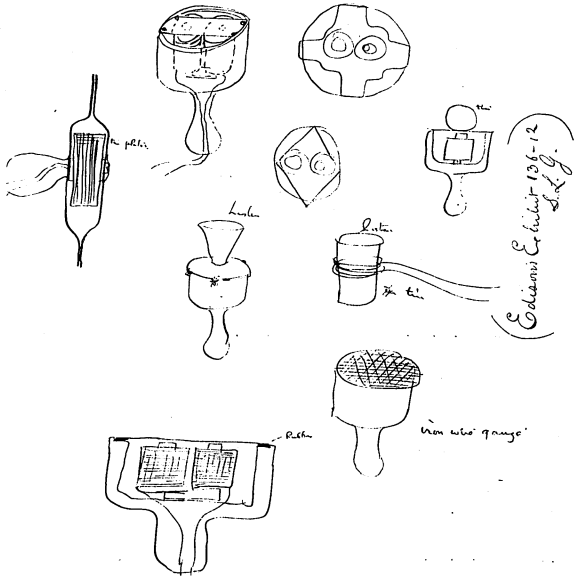
136

Oev 8

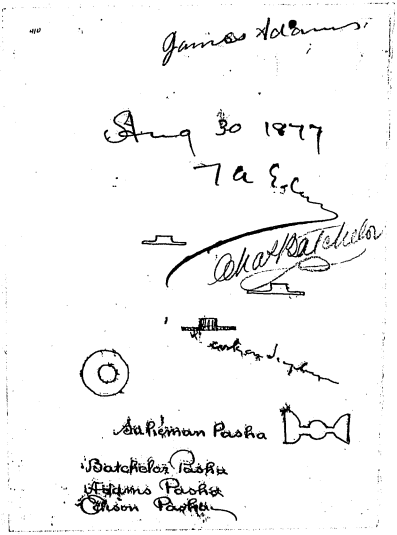
The Speaking Telegraph

Aug 30 1877
T. A. Edison
Charles Batchelor
James Adams

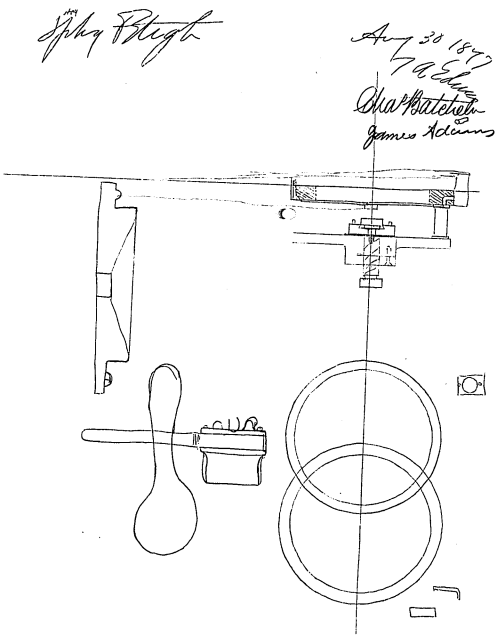
Receiving instruments



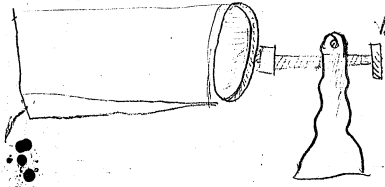
Edison's Exhibit 136-12
Ex. E.G.


James Adams
Aug 30 1877
7a E.C.
Sulpiman Pasha
Batcheler Pasha
Tytums Pasha
Olson Pasha

EDISON'S EXHIBIT. 138–12.



Speaking Telegraph Sept-2d 1877

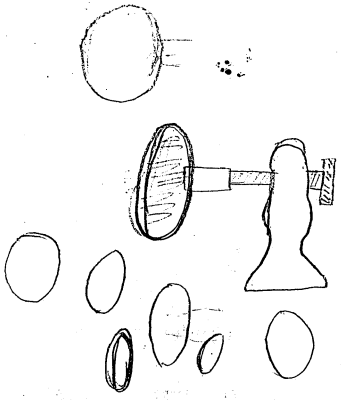


use flug x Plate full size of Diaphragm with Hard rubber ring extending out over the Beak - say 1/4 inch

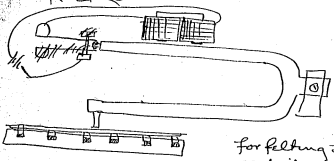
~~to~~ You will get the Vibration of the Diaphragm at all Points.

Making telegraph

Sept. 2d 1877



Speaking Telegraph



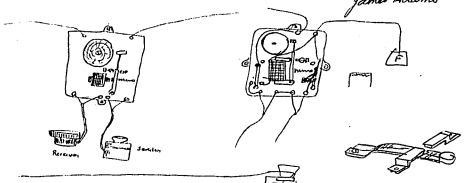
September 4 1877
T A Edison
Chas Batchelor

For telling the sick when washers or disks by many thousand taps of a tuning fork

M

Speaking Telegraph
Coff Boff.

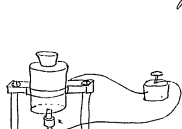
September 4 1877.
T.A. Edison
Chas Batchelor
James Adams



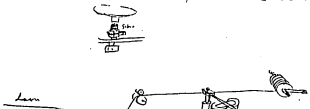
I find that the skin of properly reduced by phosphoric is a fair Conductor & with the proper amount of Nitric & Ammonia well reduced is a good Conductor Gutta Percha Chewing Gum. then will make Speaking Telegraph Contact, receiving and adjustment Except at first few days

September 4 1879
T.A. Edison
Chas. Batchelor
James Adams

Speaking Telegraph



Perhaps plumbago'd mustard seed would work in X.



Add water, Rind plumbago & by an electro magnet into date without any ground wire for Connecting especially in receiving instrument

EDISON'S EXHIBIT. 144-12.

415

Speaking Telegraph.

September 4 1877.
T.A. Edison
Charles Batchelor
Witness

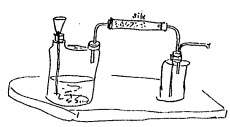
Experiments with metalization of silk fibre – Before that following the directions given in Rosslivns Book on Electro-Metallurgy that it does not work satisfactorily with 1 gram silver in 20 grams water and silk well fluffed and exposing same to a saturated solution of Phosphorus in Bi-Sulphide Carbon that only portions of skein after 2 or three days – and even then showing black is a very poor conductor no richness near as good as with plumbago merely rubbed on – we are now trying a stronger silver solution with well picked fibre previously soaked all night in water which at the time of putting it in was boiling hot, after being in the silver solution about ½ hours we took it out and dried respicked it then took a plate about 7 inches diameter filled it to depth of ¼ inch with Saturated solution phosphorus in Carbon Bisulphide. over this a wire gauze about ¼ inch from the surface of the liquid over the gauze the silk well fluffed – over this the big air pump receiver sealed by beeswax at the bottom so as to exclude all air.

#16

Speaking Telegraph

September 4 1879
T.A. Edison
Charles Batchelor
James Adams

We are trying to reduce the nitrate silver to metallic silver on the silk by passing Hydrogen through a tube containing the silk thin



We are also trying to pass Sulphuretted hydrogen through the tube containing the silk to reduce the nitrate to Sulphide of Silver which is probably a Conductor.

We propose to precipitate Conducting salts on the silk such as Iodide of Copper etc.

Soak silk in 10 grammes Sulphate Copper. 10 grammes Sulphate iron in 1 fluid oz water. Then dry. Now pass vapors of iodine through silk. Go to another part numbered in a Saturated Solution Iodide Potassium

EDISON'S EXHIBIT. 146-12.

110

Speaking Telegraph. September 5th 1879.

Of find that silk may be easily silvered and made a conductor to be used in my speaking Telegraph for varying the resistance of the line by the movement of the diaphragm. I copy here a specification which I have prepared with the idea of obtaining a patent.

" The object of this invention is to coat various materials especially materials which are non conductors of electricity, with metals,

The invention consists in depositing a salt of the metal upon the material to be coated by immersing it either in a hot or cold solution of a salt of the same in any proper solvent afterwards drying it when it is placed in a tight receiver box, or closet or other proper receptacle within which is a quantity of moist Phosphide of Calcium or other Phosphide of an element which slowly evolves Phosphuretted hydrogen by moistening it.

The operation is as follows If say a silk garment is to be silvered, I immerse it in strong hot solution of a salt of silver preferably the nitrate of silver allowing it to remain a few minutes or such a length of time as will in Extended Experience be found to give the best results

"

Speaking Telegraph

September 5 1874

It is taken therefrom and thoroughly dried, afterwards it is taken to the tight closet & suspended over a large flat dish which is covered to the depth of say 1/16 inch with moist Phosphide of Calcium. By the action of the water this Phosphide of Calcium is decomposed and Phosphuretted Hydrogen set free, this acting upon the nitrate of silver reduces the silver upon the silk to a metallic state, the time required to effect perfect reduction is only a few minutes if the Phosphuretted Hydrogen is given off in great volume.

I am aware that it is not new to reduce a silver salt upon materials by phosphorus. I am also aware that Phosphorus dissolved in its solvents such as Ether, or Bisulphide of Carbon have been placed in evaporating dishes in sealed jars over which was suspended an article containing salts of a metal to be reduced, But the use of Phosphorus in solution is quite dangerous, unreliable in its action, inconvenient and very slow and it does not penetrate like the Phosphuretted hydrogen to every part of the material, neither is it so energetic

EDISON'S EXHIBIT. 148–12.

412

3

Speaking Telegraph

September 5th 1877

I will mention that liquid phosphoric of Ethyl oxygen may be used.

I claim as my invention

Reducing metals from their salts upon any material by exposing the same to the fumes of phosphuric of Ethyl oxygen

2nd Reducing metals to the metallic state from the salts by exposing the same to the fumes which arise from a phosphide of an Element which is decomposed by moistening it

T A Edison

Witness Chas Batchelor

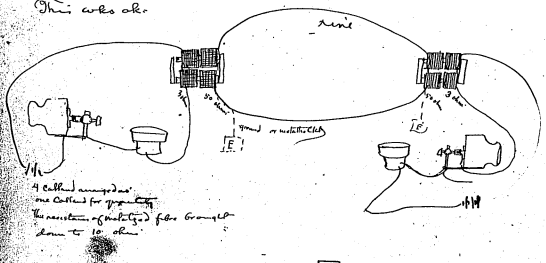
Speaking Telegraph.

Sept 8 1877
2d Edition
Chas. A. Tichelor
James Adams

I propose to cover the fibre with metals by the process described in the September number of the American Journal of arts and Science. No 81 Vol XIV. New Haven 1877 page 169 to 175. This will get rid of the effect of the acids used with the phosphorous plan. I find that by my small coil it can be done to a certain Extent but it will require a larger one to do it well.

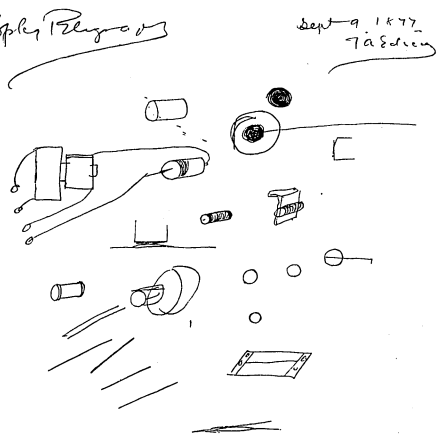
Working by induction

This works ok.

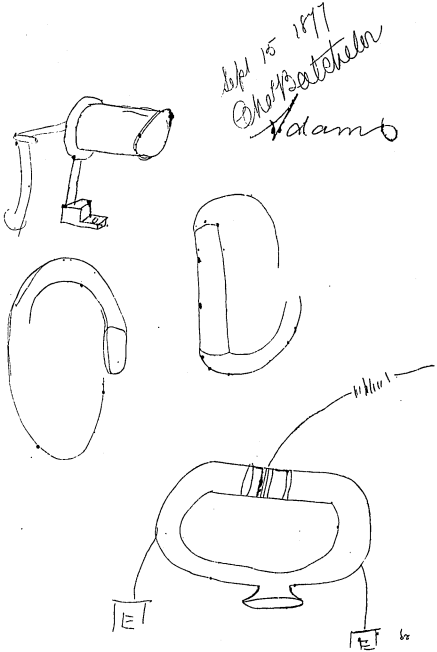


149

EDISON'S EXHIBIT. 151–12.



EDISON'S EXHIBIT. 152–12.



Speaking Telegraph

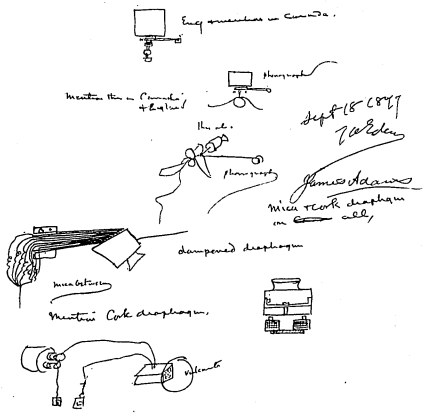
Sept 19 1877

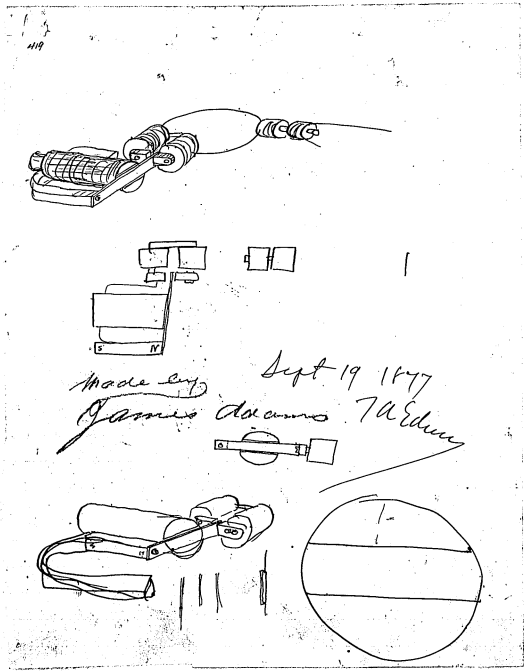
That a large number of Blickensderfer dishes say 8 or 10 have
[illegible] make speaking perfectly loud and it may be so
[illegible] as to be very sensitive, transmitter placed
feet from speaker conversation can be carried
on and [illegible] doubt but if every
[illegible] Receiving instrument was used that
the voice of the speaker in any part of the
Senate or House Chamber could always
be communicated to a distant point during the
telephone was placed permanently on the
Speakers desk

I propose to dampen the diaphragm in a Bell
Telephone by strips of rubber plastered over
them - this will use prevent Harmonical
Sounds

153

418 Foreign Telephone

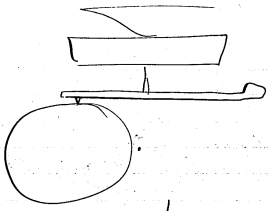


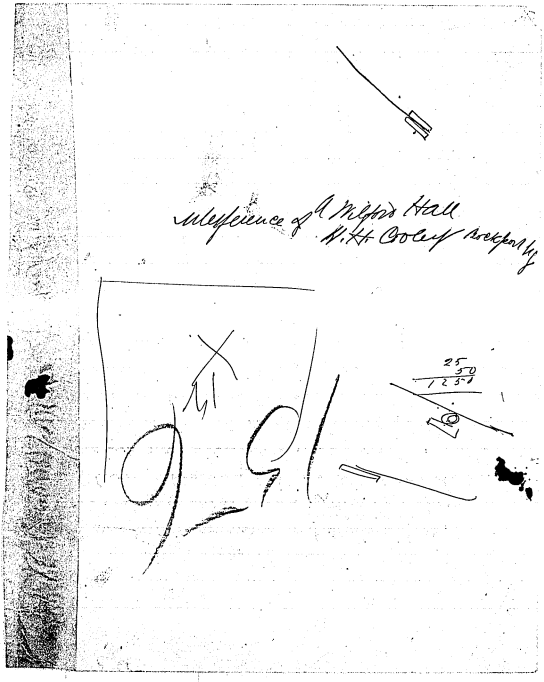

119
S
N
Made by
James Adams
Sept 19 1877
TA Edison

The invention of pantin telephone was conceived about the middle of September 1877, and was reduced to practice about November 1877. Several forms of lever intervening between the receiving point & the diaphragm were tried, and used and publicly exhibited, about that time. and I have

Drawing Fig. 2=78

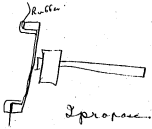
Sept 19 1877.



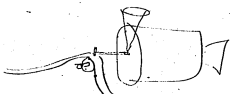

Influence of R. Mifflin Hall
W. H. Cooley Autograph

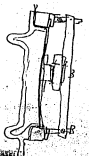
Speaking Telegraph

Sept 20 1877
J A Edison
Chas Batchelor
James Adams



I propose to patent the rubber diaphragm in Connection with the Bell Telephone diaphragm right of

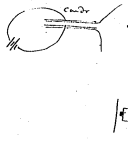


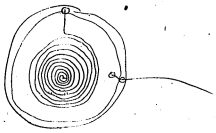


Speaking Telegraph

Sept 20 1877
T A Edison

James Adams

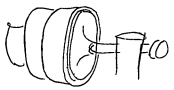


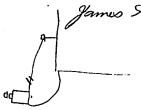


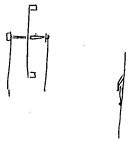
EDISON'S EXHIBIT. 159–12.

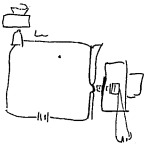
425

Sept 20 1877
Witness
James Adams

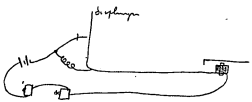


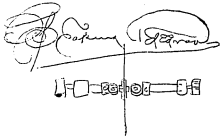


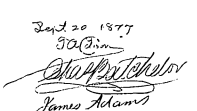


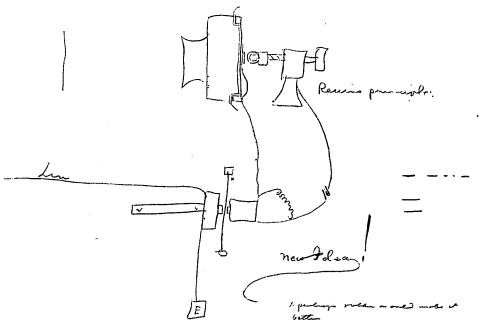


magnetic attraction
mc






Sept 20 1877
Witness
Witness
James Adams

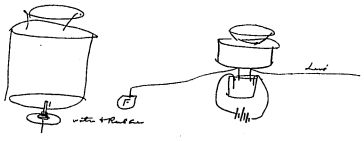

Receiver
New Idea!
E

#32

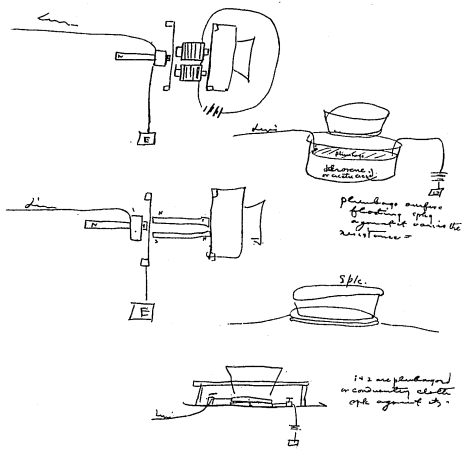
Speaking Telegraph

Sept 20 1877
Salem
Chas Batchelor
James Adams

The plans of the rubber diaphragm for preserving the regular
diaphragm in the same plane unless allowing it to be free &
then Counterweight Expansion & can use
Pongee silk, silk tissue, silk net or cloth
with large substance like animal muscle of
Frog Calf, Rabbit, rubber silk etc.
The diaphragm is loosed, may have the
Harmonics destroyed by glueing cloth Patch
or other dead substance to it.



Sept 20 1877
J A Paine
Witness
Alex Batchelor
James Adams



EDISON'S EXHIBIT. 163–12.

#30

Speaking Telegraph

Sept 20 1877.

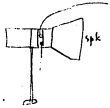
Or now dispense with the Silk Cloth or loose fibre with intermixed plumbago and use cloth, preferably such Cloth impregnate it with a syrupy solution of plumbago in Distin water. The impregnation is made more thoroughly by jobbing it in by needles it is allowed to dry when the cloth Exhibits a beautiful surface, washers or rather discs are cut from it and these made generally have 13 ohms resistance though much lower when the plumbago is well worked in the Distin Causes it to adhere with great tenacity to the fibre, Instead of Distin any sticky substance may be used, or matter which when mixed with the plumbago will cause it to adhere to the fibre. Velvet may be used the plumbago being forced through the body of the Extraordinary pliable fibre is also Cotton is of course powerful and other compound Cellulose or finely divided metals may be used =

T. A. EDISON,

Menlo Park, N. J., 1880.

Sept 21 1877
T.A. Edison

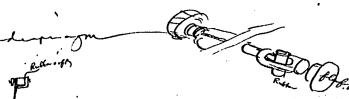
Speaking Telegraph



Attach platinum point to the center of the diaphragm so that the undulations will take hold to some to the pole & this will generate Currents that may be assembled & received upon a exceedingly delicate diaphragm & magnet.

I propose to make battery upon the principle of Pulvermacher's chain for my Regular Telephone =

In Damped diaphragm



Edisons Exhibit 164—12. S.L.B.

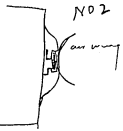
Mica diaphragm 2 rows of fine platinum points about 1/8 inch apart to prevent the effect of expansion & Kill harmonics both Pos & Neg to work beautifully we made a lot of telephones this way and they all showed about the same Efficiency Hunky Dori

JSC

Sept 21 1877

Edisons Exhibit 165–12
S.L.G.

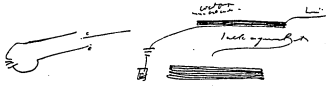
Working Gyrostat momentum
no assistance

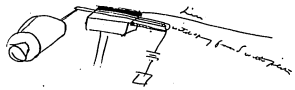


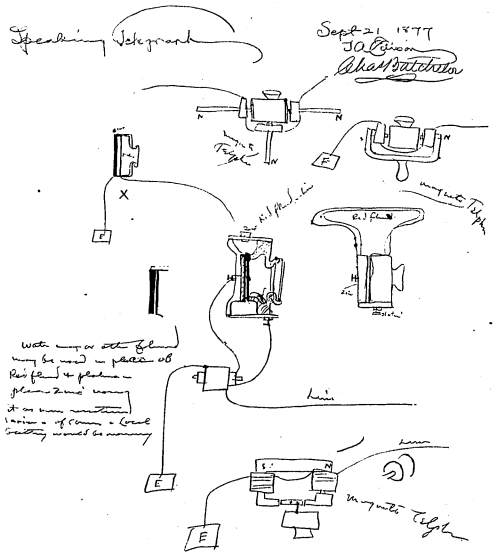
+35

Speaking Telegraph

September 21 1877
J. A. Edison
Chas Batchelor Jr.

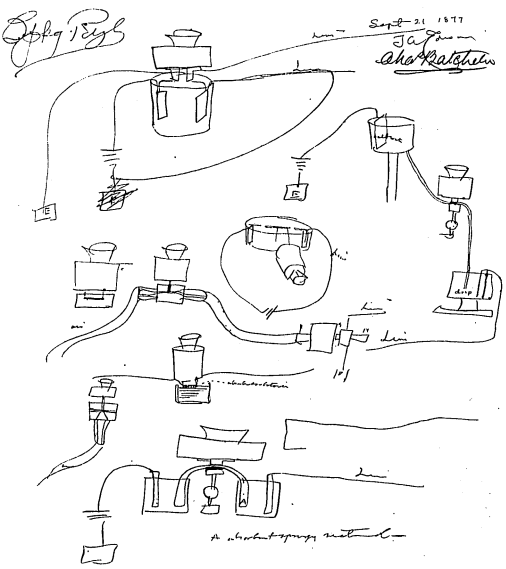





Speaking Telegraph
Sept 21 1877
J.O. Pierson
Chas Batchelor
X
E
E
E
Line
Magneto Telephone

EDISON'S EXHIBIT. 168–12.

434

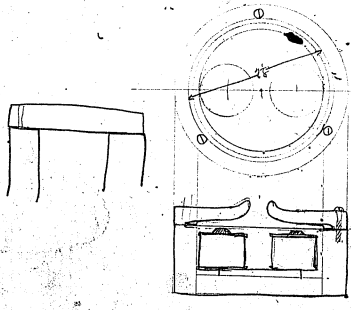


Speaking Telegraph

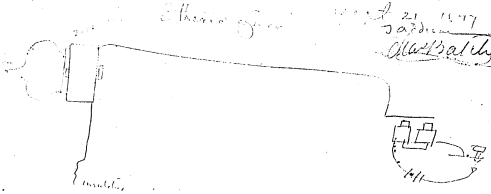
Sept 21st 1877

Chas Batchelor

Made from Mandrel for making zinc shells



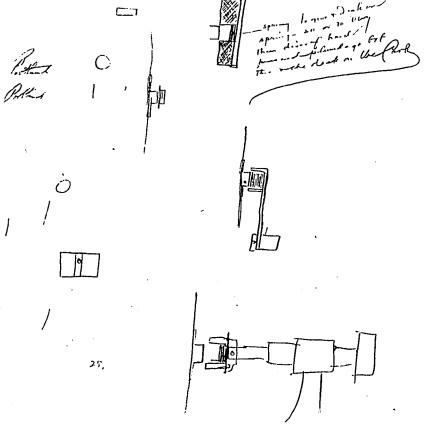
169



+30

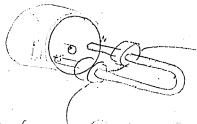
Speaking telegraph.

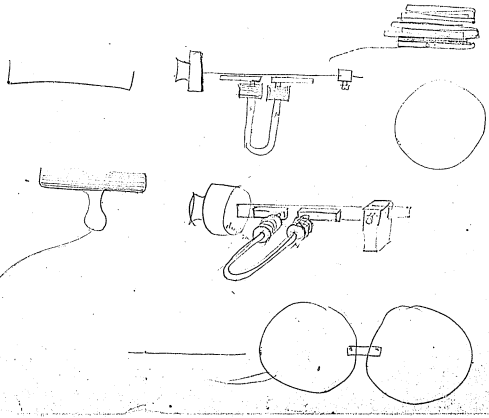
Sept-21, 1877.



Optag Telegram!

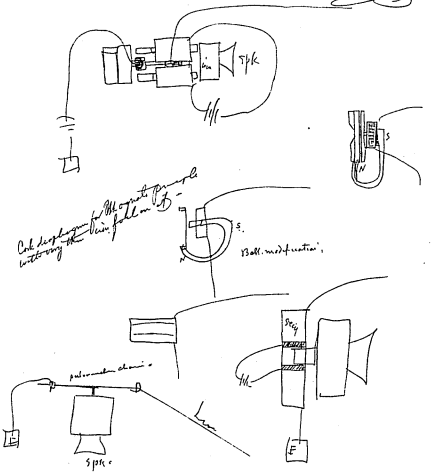
Sept 1899 – 21
Jacobsen
Glasballeeller





H 27

Sept-21 1877
T.A. Edison



EDISON'S EXHIBIT. 174–12.

p 11

Sept 22 1877

Speaking Telegraph

Chas Batchelor

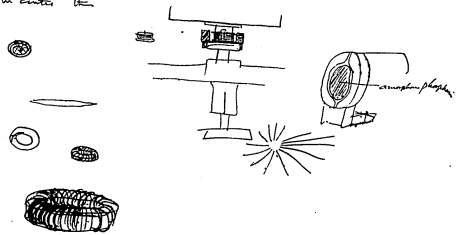
We found that the diaphragms change their position so easily by heat effects that it is impossible to use a rigid plug holder hence we go back to the old spring device and we find that the plug works ok with it although we had had luck with it as solid plug. we find adjustment ok & readily found with resistance = plug of 15 ohms

Speaking Telegraph Sept 22 1874

flush

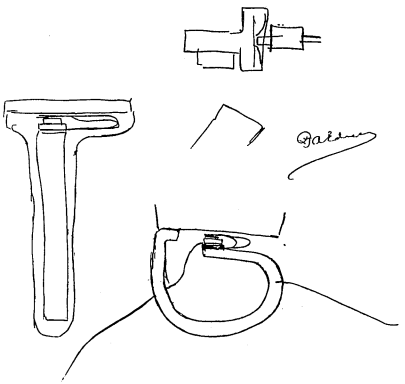
single plumbago-faced wound w/ thin steel disks of plumbago-faced paper - also opaque disk

also would like a magnet with a steel ring bridge in center like



EDISON'S EXHIBIT. 176–12.

Sept 22/77



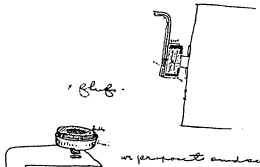
EDISON'S EXHIBIT. 177–12.

#20

Electric Pen & Duplicating Press.

Sept 24 1877.
Ja Edison
Chas Batchelor

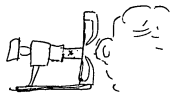
CB I have got the plug big enough to mighty - like.



as per sketch and send me by office with Cook Machine -

Sept 24 1877

Tonight while listening spoken words very
faint but had them quite loud when I heard
current mix up from Butler & the noise
or thought he heard Gray talking in distance
upon investigation we found that it was
really so had gone to try it & he heard
Conversation was kept up few minutes
had 12 Cells Battery & Current was 1200
ohms. but at 100. Could do big work
or his was down a little how the talk was
Could be heard by intensity Low or
Couldn't be heard at all I propose to
Conduct a series of Experiments on a
Resistance based on the Expansion principle
thus



X is diaphragm through
Sing

EDISON'S EXHIBIT. 179–12.

Speaking Telegraph

Sept 24 1877

C. L. Edison

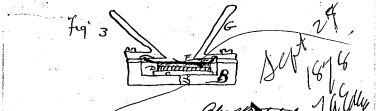
Charles Batchelor

~~Also~~ I find that it is almost impossible to find a substance that will stand plumbago to fill for volume which of an egg. Such as Bone Peru Sugar Wallflower Bark & in Chloride Zinc. would stand it as in Preparing & Comm of all but of fine Asphaltum Carnauba stands it as Gratefully but unfortunately when the fluids are mixed and put in the transmitter and a speech the talking is no good I am due to the effect of the heated plumbago on the Asphaltum Expanding The Compressed fluids in the regular position the idea occurred that certain material such as rubber etc could be made into Discs the plumbago and in a cylinder & if it was he could work a disk of metal & point with a screw just what it might be used as a relay by passing the Current through the cylinder & Expanding to close circuit

Carbon of Iron & other metals.
Oxide Manganese ~~with oxides~~
Oxide of Copper.
Sulphide of Iron.
~~Sulphides of~~ Copper & other conducting ~~oxides~~
&
Amorphous Phosphorus
Protoxide of Iron
~~Peroxide of Copper~~ & other conducting oxides,
Carbon in form of plumbago ~~& Sulph of Iron~~
Coal, Gas retort carbon, soot & Lamp black Charcoal

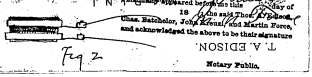
Finely divided metals ~~such as~~ Copper & those which do not oxidize
~~and Copper zinc~~ platinum, metal of gold.
Iridium Osmium Ruthenium,

All of the above may be mixed with various
~~Such~~ non conducting substances to render
them less conducting and give the button
the proper elasticity -



Sept 24, 1878
Chas Batchelor
Wm Kelly

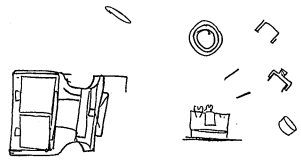
There may be several buttons placed one over
the other, either with or without metal plates
between,

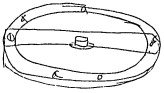


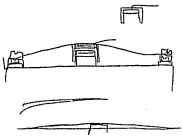
Sworn & subscribed before me this
18 day of
Chas. Batchelor, John Kruesi, and Martin Force,
and acknowledged the above to be their signature
Notary Public.

Sept 26 1877
T.A. Edison

The frame with flightwheels works good nearly fast enough and adhesion Gallon than those we have in Nugents = Resistance 20 to 30 ohms coils =



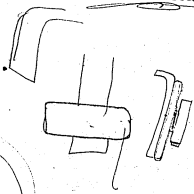


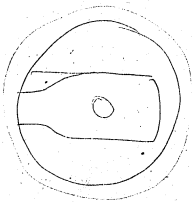


Spring Telegraph

Sept 28 1874

T A Edison





"44"

Sept 28th 1877

Speaking Telegraph

Chas. A. Tainter

Test of Instruments

No 18 & 22 Fluffy hard

No 21 " very soft

No 19 Speaking good Tests 120 ohms

No 22 " " Tests 101 ohms

No 18 " " Tests 100 ohms

" No diaphragm of 18 too very brittle

No 17 Talking good Tests 119. — —

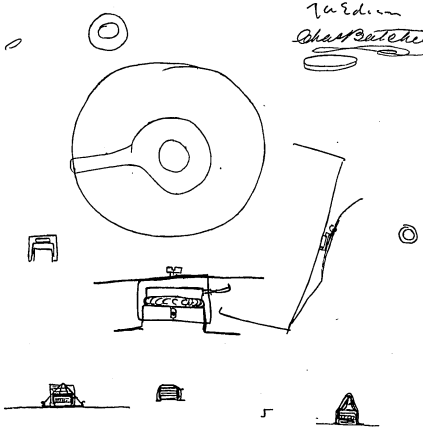
No 20 Talking good Tests 120 ———

No 21 Talking good Tests 100 ——

EDISON'S EXHIBIT. 185–12.

443

Speaking Telegraph
Sept 28 1877
Thos Edison
Chas Batchelor

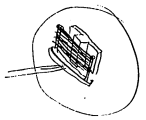


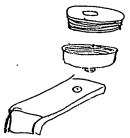
EDISON'S EXHIBIT. 186-12.

Speaking Telegraph

Sept 29 1877
T A Edison
Chas Batchelor

proper to coat threads stretched as shown which threads are plumbago'd





I believe we could coat Asbestos fibre or mineral wool fibre or even fine cotton glass well & plumbago it by using Asphaltum varnish then the fluffy would be perfectly conductive

T. A. EDISON,

Menlo Park, N. J., ... 1880.

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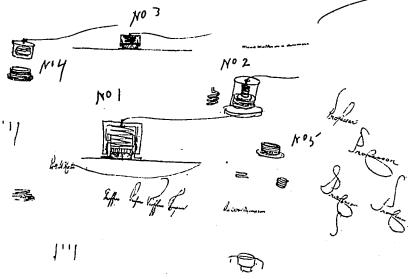
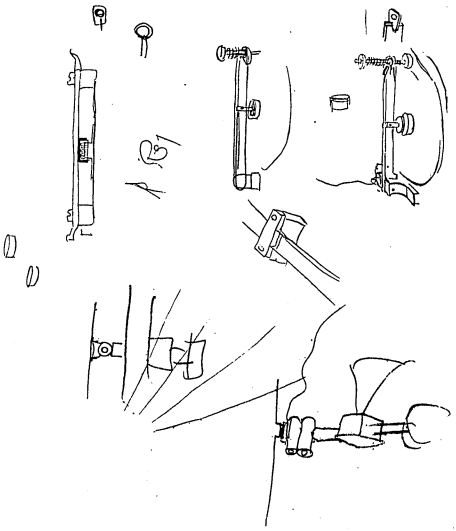
EDISON'S EXHIBIT. 188–12.

Edison's Exhibit 188 – 12



EDISON'S EXHIBIT. 189–12.